

FLIGHT

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1932.
- Dec. 8. "Air Survey." Lecture by Lieut. J. S. A. Salt, R.E., before R.Ae.S.
- Dec. 9. D.H. Technical School Students' Ball, at Portman Rooms.
- Dec. 9. Kent Flying Club Annual Dance, at County Hall, Canterbury.
- Dec. 10. Maidstone Ae.C. Annual Dance.
- Dec. 14. "Air Power and Disarmament." Lecture by Group Capt. J. T. Babington, before R.U.S.I.
- Dec. 14. London Ae.C. Annual Dinner and Dance, at Park Lane Hotel.
- Dec. 15. Forum Club, Aviation Group, Dinner to Women Private Owners and Pilots.
- Dec. 16. College of Aeronautical Engineering Annual Dinner, and Dance, Park Lane Hotel.
- Dec. 16. No. 70 Sqdn., R.A.F., Reunion Dinner at R.A.F. Club.
- Dec. 23. Liverpool and Dis. Ae.C. Annual Dance at Mostyn House School.
- Dec. 23. Eastern Counties Ae.C. Dance at Gt. White Horse Hotel, Ipswich.
- 1933.
- Jan. 6. Bristol and Wessex Ae.C. Dance, at Grand Spa Hotel.
- Jan. 6. No. 25 (F.) Sqdn., R.A.F., Re-union Dinner at May Fair Hotel.
- Jan. 11. B.G.A. Ball in Honour of Mrs. Mollison, at Portman Rooms.
- Jan. 12. "Airship Development Abroad." Lecture by Sqdn.-Ldr. R. S. Booth, before R.Ae.S.
- June 24. Royal Air Force Display, Hendon.
- Feb. 1. "Recent Operations in Kurdistan." Lecture by Group-Capt. A. G. R. Garrod, before R.U.S.I.
- Feb. 1. Entries close for the Deutsche de la Meurthe Cup (Aero Club de France).

EDITORIAL COMMENT



BEFORE Mrs. Amy Mollison started on her great flight down West Africa, the French authorities stipulated that she must deposit a sum of £1,300 to cover the cost of sending aeroplanes to look for her if she should be forced down in the Sahara. Fortunately she was not obliged to forfeit the deposit. The French are often wise in their generation, and we think it would not be a bad thing if the Air Ministry were to require a deposit from any civil pilot who proposed to fly across territory where a mishap would mean sending out Royal Air Force machines to search for him or her. In fact this incident of the French and Mrs. Mollison has drawn attention to the very great amount of "lifeboat" work which the Royal Air Force and other air forces are obliged to do. Taking life is not the only function of the R.A.F. In peacetime its machines are constantly engaged in saving life. The outstanding classical example is the evacuation of the foreigners in Kabul. The story makes one regret almost with tears that there were no aeroplanes in the days of Col. Cavagnari. Had the Wrights, Farmans and Sir Alliott Roe lived 50 years earlier, perhaps the two Kabul massacres could have been averted, and then there would have been no need for the two costly and bloody Afghan wars which followed them. It is very pleasant to think of the numerous risings on the Indian Frontier, in Iraq, in Transjordan, in the Aden Hinterland, in the Sudan, and in other parts of Africa which have been nipped in the bud by the mere appearance of aeroplanes and the dropping of warnings. In the Government report on the administration of Iraq published in 1925 it is written: "By prompt demonstrations on the first sign of trouble, carried out over any area affected, however distant, tribal insubordination has been calmed before it could grow dangerous, and there has been an immense saving of blood and treasure. . . . Now, almost before the would-be rebel has formulated his plans, the droning of the aeroplane is heard overhead, and in the majority of cases their mere appearance is enough."

This police work in overseas territories has been a most important feature of R.A.F. routine work since the great war, and it can certainly be deduced from Sir John Simon's speech at Geneva that the British proposals for disarmament in the air do not contemplate any interference with this class of work. To keep peace, mainly without killing, and at a minimum of cost, is a great and noble work. When one comes to guess at the number of lives which might have been lost in action and by disease if all these little risings had come to a head, one can only marvel at the life-preserving powers of the Royal Air Force.

No record has ever been compiled—or at least published—so far as we know, of the number of lives of airmen and others which have been saved by the machines of our Air Force, and likewise in all probability no account of the cost of such operations has ever been drawn up. At sea, salvage rates are recognised. On the road, hospitals and doctors have voiced a fairly loud complaint that the victims of motor accidents seem to accept all attentions as a matter of right, and are very loath to pay for them. The R.A.F., we believe, saves life when it can but sends in no bill. In these days, when it is the fashion to say all manner of hard things about the "menace in the sky," it may be salutary to recall just a few of the cases in which the aeroplane has appeared to those in distress as a veritable rescuer from the heavens.

Plenty of people have been lost in one or other of the deserts of the Middle East and Iraq and have been rescued by the Air Force. On one occasion two lorries were conveying some 40 Arab pilgrims from the holy places of Iraq to Syria. The drivers lost their way and got on to the track which leads to Jerusalem. They ran out of petrol, then out of water and food, and were reduced to eating the grease on the lorries. When it was known that the lorries were overdue, of course the R.A.F. were informed. A R.A.F. armoured car convoy found the lorries. One or two of the pilgrims had already died, but the rest were saved.

Cases of taking patients from outlying parts to hospital are numerous. One of the earliest cases in Iraq occurred soon after the opening of the Cairo-Baghdad air mail by the R.A.F. Incidentally it should not be forgotten that that air route, now worked regularly by Imperial Airways, was originally opened up by the R.A.F. A Beduin sheikh was taken very ill with appendicitis, and the R.A.F. came to hear of it. Aeroplanes were still strange wildfowl in Iraq then, but the sheikh consented to be flown into Baghdad, where he was operated on in hospital, and his life was saved. Ever since then that sheikh has declared that all flying men are his brothers, and he has extended his protection and

hospitality to all of them whom he has met in the desert. At times it is even more urgent to take doctors to the scene of operations. One instance occurs to mind of R.A.F. machines taking three doctors from Cairo to an area in Upper Egypt where plague had broken out.

It is not only for the opening-up of the desert route from Cairo to Baghdad that Imperial Airways is indebted to the R.A.F. They frankly admit that they received very great help from the flying boat squadron at Basra when they were considering their new route down the Arabian shore of the Persian Gulf; and they know too that if ever one of their *Hannibal* machines gets into trouble the R.A.F.

flying boats will be ready to come to the rescue. Of course there may be cases of mechanical trouble which the organisation of the company will be able to deal with itself. But one cannot quite rule out the possibility of political trouble, and then it is a comforting thought that the "Rangoons" of No. 203 (F.B.) Squadron will waste no time in flying down and putting things to rights.

The latest instance of all of philanthropic action by the R.A.F. in Iraq is the dropping of supplies to tribes of Arabs in the Mosul district who have been isolated by the flooding of the rivers. Many of these Arabs were recently in revolt, and then the aeroplanes meant something different to them from what they now signify.

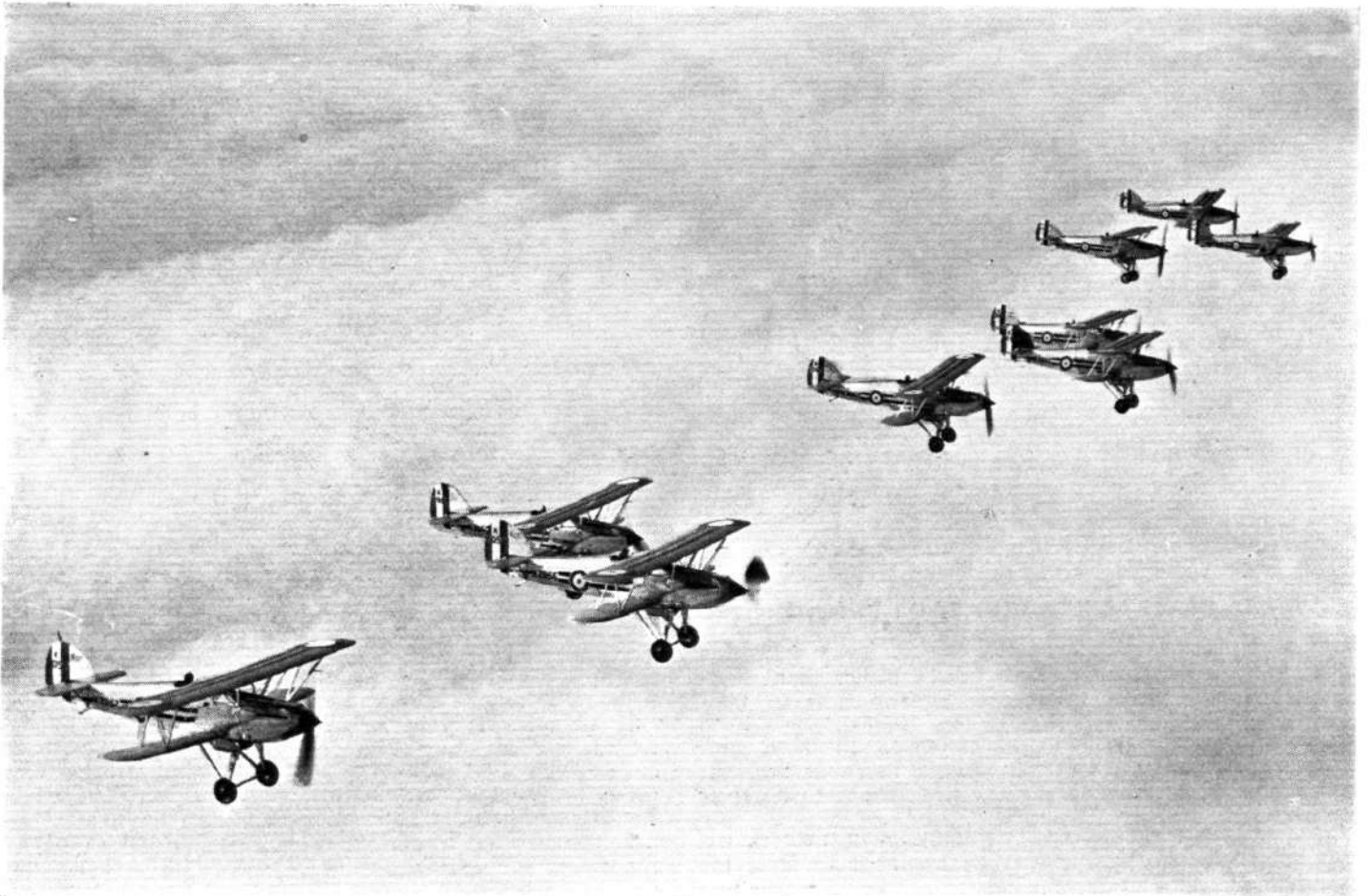
Possibly the rescues which attract most attention, but are actually the least meritorious, are those of adventurous air pilots who get themselves into trouble and are rescued by the Royal Air Force, as Mrs. Mollison might have needed rescue by the French aircraft if her "Gipsy Major" engine had proved less impeccable. Two outstanding cases of recent years were those of the two Spanish pilots, Major Estevez and Commandant Franco, with their companions. The former was forced down in the Transjordan desert, east of Amman, and he and his mechanic were found by the Royal Air Force just in time. Commandant Franco attempted to fly the Atlantic in a Dornier "Wal," and was adrift for a week off the Azores until the carrier H.M.S. *Eagle* went to the rescue, and her aircraft spotted the flying boat and brought the carrier up just as hope was almost abandoned.

It would not be difficult to draw up a list of plenty of other non-warlike tasks which the R.A.F. carry out in the East and Middle East. They transport officials in a hurry, they make photographic surveys, they carry out locust-dusting campaigns. All these are tasks which would properly fall to civilian flying firms if any were on the spot; but when there are none such available, then the Service takes the matter in hand. Remember, on our frontiers the Royal Air Force is a great agent of peace and progress.



LORD WAKEFIELD OF HYTHE

A portrait painted for the Royal Aero Club by Capt. J. H. Birley, which was unveiled by Lord Londonderry at the House Dinner on December 7.



NO. 25 (FIGHTER) SQUADRON (HAWKER "FURIES" AND ROLLS-ROYCE "KESTRELS") : "Flights Line Abreast" above Hawkinge. (FLIGHT Photo.)

No. 25 (Fighter) Squadron

Interceptors at Hawkinge

By MAJOR F. A. de V. ROBERTSON, V.D.

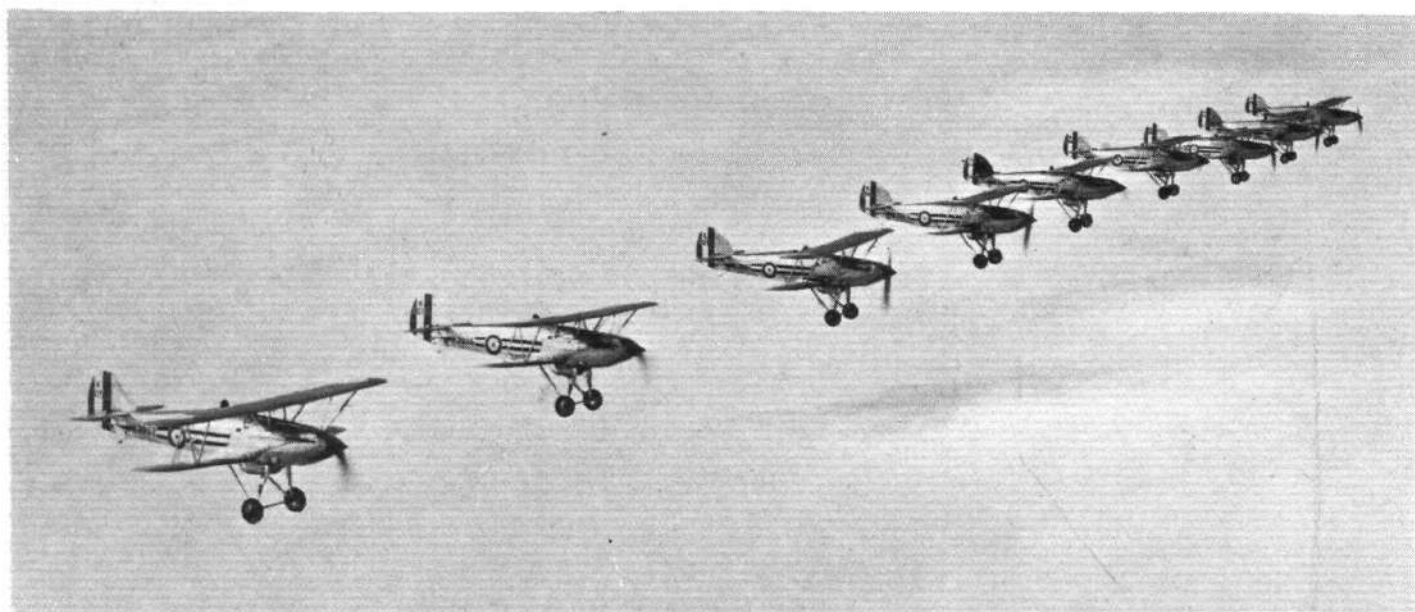
"**H**ULLO, Mosquitos! Alter course 16 points outwards." This order was given by King George, speaking into the microphone at the Royal Air Force Display at Hendon in 1925. The squadron up above, whose call sign for the day was "Mosquitos," was No. 25 (Fighter) Squadron, flying "Grebes," and led by Sqd. Ldr. A. H. Peck, D.S.O., M.C. At the moment the squadron was flying in the formation then known as "Double Line Ahead," with Peck leading, followed by two parallel files of four machines each. The King's order was transmitted to the R/T. receiving sets on the machines, then used for the first time at a Display, and immediately the squadron executed a "Prince of Wales' Feathers." The leader zoomed up in a half-loop and righted himself by a half-roll, while the two lines made climbing turns outwards, so that in a minimum of time the whole squadron had reversed direction, maintained its formation, and gained height. No more accurate drill than that of No. 25 (Fighter) Squadron had ever been seen before at Hendon, or has been seen since. The same squadron was chosen next year to give a display of squadron evolutions at the Display.

Now the "Grebes" are almost forgotten; "Siskins" have come and gone; "Furies" are now the order of the day at Hawkinge; but still No. 25 F.S. keeps up its high reputation. Last April it received its "Furies" and became an interceptor squadron—a distinction which is sufficient evidence of the squadron's quality.

The very term "interceptor fighter" is intriguing. The public has rather vague ideas as to its precise meaning. It may be said that the decision to evolve this class of aeroplane was taken as a result of the early Air Exercises in 1927 and 1928. It was found that the fighters of that day could not get on terms with the fastest day bomber

of the time, namely, the "Fox," with which No. 12 (Bomber) Squadron was equipped. It was decided to ask the designers to produce a type in which the chief qualities should be a power of rapid climb and high speed at great altitude. Other considerations, such as endurance, might have to be sacrificed to these demands, but the authorities were agreeable to this. It seems to have been settled from the first that the squadrons on the coast aerodromes at Tangmere and Hawkinge, namely, Nos. 43 and 1 F.S. at Tangmere and No. 25 F.S. at Hawkinge, should be the interceptors.

The original idea seems to have been that the function of these interceptors would be to wait on the coast as sentries stand outside a gate until a raid was reported to be approaching the coast from across the sea, when they would rise into the air at phenomenal speed and cut it off before the bombers got inland and did any damage. On the other hand, it has been stated that from a very early stage the Air Staff realised the improbability of this manœuvre meeting with success, and that they meant the interceptors to catch the raiders on their way back to the coast. Whatever was the case (and we are not in the confidence of the Air Staff), the experiment was tried in the Air Exercises of 1931 of letting No. 43 F.S. (the only squadron then equipped with interceptors) operate from Tangmere. It was not successful in engaging bombers on the way in. They crossed the coast very high, and were far inland before the interceptors had time to climb to their level. In actual warfare the success might have been greater, as warships at sea might have sent more timely warning. In Exercises the reporting of raids did not begin until the coast had been crossed. However, by the time the Air Exercises of 1932 were planned the authorities had grasped the fact that the proper function of an interceptor is to intercept, namely, to attack the



"SQUADRON LINE ABREAST" : Perfect formation flying by No. 25 (Fighter) Squadron. (FLIGHT Photo.)

raiders before they release their bombs rather than afterwards. So the three interceptor squadrons were temporarily moved inland, No. 25 to Kenley, No. 1 to Northolt, and No. 43 to Upper Heyford. In those positions time was given for raid reports to come through, and the interceptors were given a real chance to do their proper work.

It was at the Olympia Aero Exhibition of 1929 that a first sight was given of the types produced to meet the requirements of the Air Ministry. The consideration was long and careful, and at last the choice fell upon the Hawker "Fury," with Rolls-Royce "Kestrel" engine. The first squadron to receive the new type was No. 43 F.S. in 1931, while No. 25 F.S. only received its "Furies" in April, 1932.

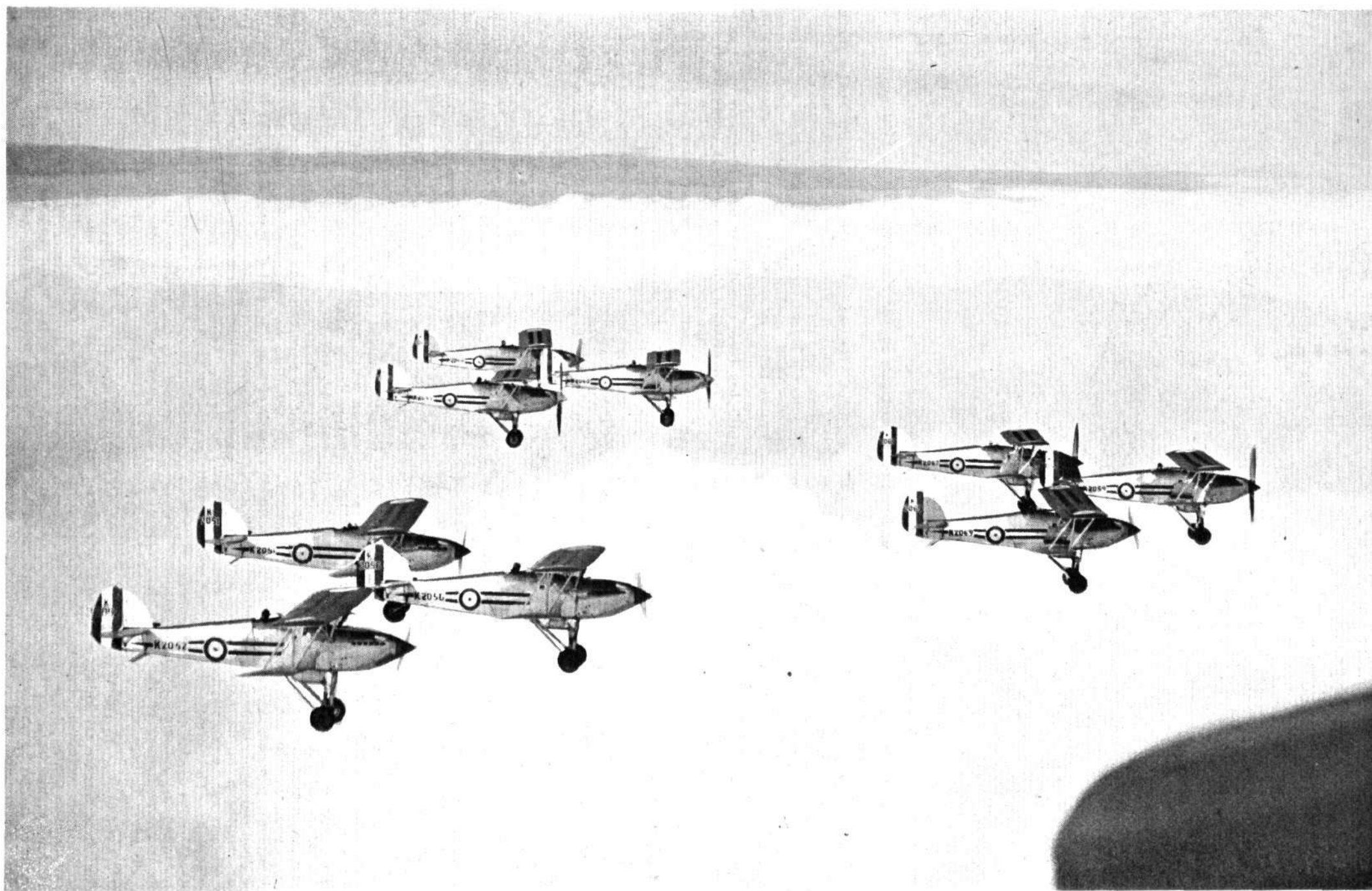
The work of an interceptor squadron goes on unceasingly. That, of course, is true of all units of the Royal

Air Force; but a very special responsibility rests upon the interceptors. They must work to split fractions of split seconds. If they are constantly keyed up to the uttermost degree of concert pitch, they may be able to shoot down raiders that would otherwise wreak great havoc in London. On an ordinary working day, when the maroon is fired, the duty flight (battle flight they call it) must be in the air in not one second over two minutes. Woe betide anyone who is late! Only unremitting practice can keep all ranks in this state of preparedness; but constant drill makes a seeming miracle into an ordinary piece of the day's work. *Moi qui vous parle* have seen the battle flight of No. 25 F.S. take off on the sound of the maroon, and it is a sight which makes one marvel.

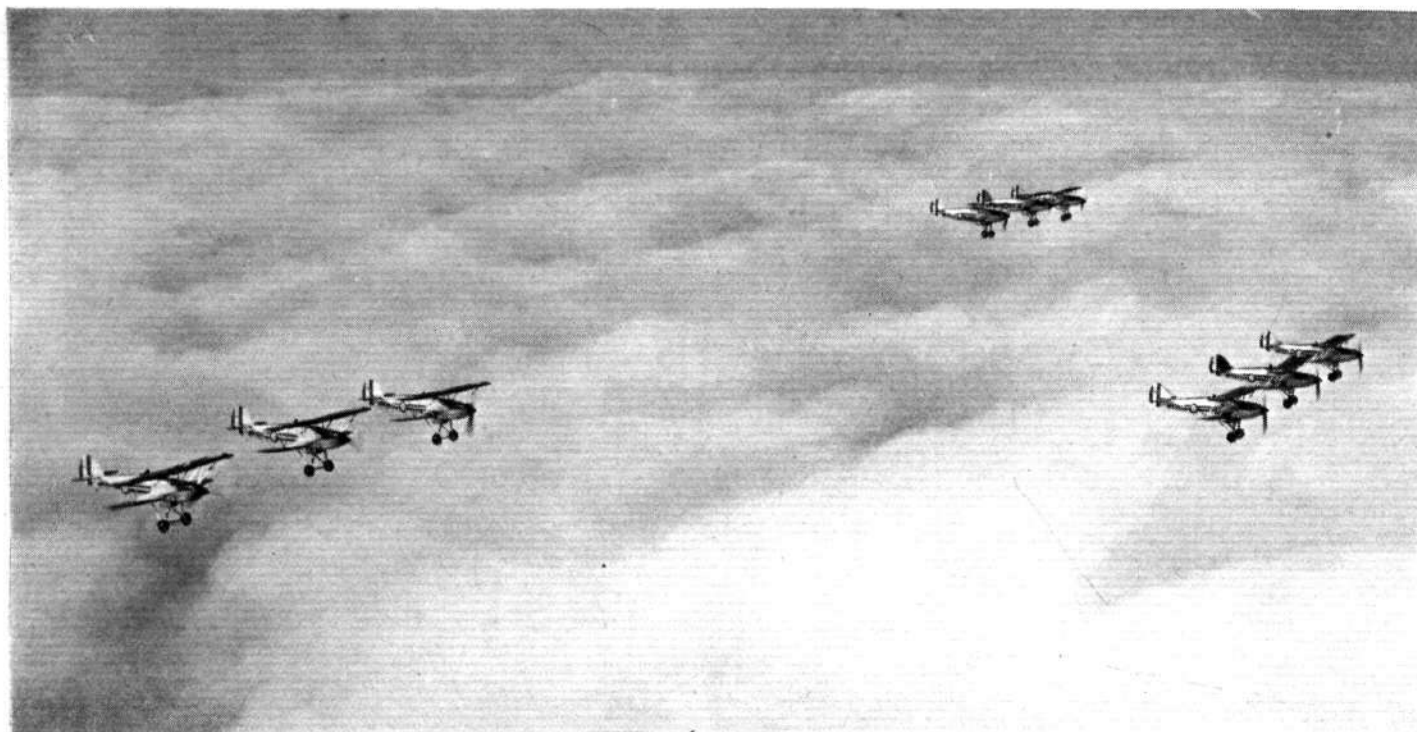
Perfection of drill is not the only concern of the squadron. All fighters must fight with their brains, and aircraft



OFFICERS OF NO. 25 F.S. : Back Row—F/O's. L. F. Brown, A. E. Clouston, T. A. Head, R. G. Harman, R. G. Arnold and P/O. T. A. Hunter. Middle Row—F/O. H. St. G. Burke, F/O. R. P. Garnons-Williams, Flt. Lt. G. P. MacDonald, Sqd. Ldr. W. E. G. Bryant, M.B.E., Flt. Lt. C. R. Hancock, D.F.C., F/O. F. P. R. Dunworth, F/O. N. Daunt, F/O. J. N. Dufort. Front Row—F/O's. A. E. Douglas-Jones and K. B. B. Cross. (FLIGHT Photo.)



SQUADRON FORMATION : No. 25 (Fighter) Squadron flying their interceptor Hawker "Furies" (Rolls-Royce "Kestrels") above the clouds. (FLIGHT Photo.)



ACCURACY : No. 25 F.S. in squadron formation with flights in line abreast. (FLIGHT Photo.)

have made such great advances since 1918 that war precedent is almost valueless. The fighters must always be devising tactical schemes for attacks on modern bombers, whether singly or in formation. Interceptors are not, in my opinion, likely to be used for night fighting; that would waste their peculiar merits. Their problem is to match themselves against the "Harts." A single "Hart" is quite a formidable adversary, and the fighters like (if possible) to have odds of 3 to 1. Then two "Furies" attack from above, one from the right and one from the left, while the flight lieutenant manoeuvres to get under the tail. Synchronisation of attack by all three gives the best chance of success, for then the gunner in the "Hart" is outnumbered. Another problem is for the whole squadron to attack a whole squadron of "Harts." The bombers have no initiative in the fight, except by hiding in clouds when possible. They must keep on their course in formation, trusting to the cross fire of their gunners to keep the fighters at a distance. The "Furies" have to devise means of diverting them from their course, and, if possible, breaking up the formation. It is a very pretty problem; and few such fights are likely to end without bloodshed—or at least the use of parachutes.

Fortunately, the "Fury" is a machine of exceptional parts. Its maximum speed at 15,000 ft. is 205 m.p.h. It carries 50 gallons of petrol and uses from 20 to 30 gallons an hour, according to the work it is doing, and its average endurance is reckoned as 1 hr. 50 min. Its landing speed is remarkably low for such a fast fighter, and it has wheel brakes to pull it up.

When squadrons first came to practise with the "Fury," they found that all their previous ideas of fighting tactics had to be revised. A certain length of dive had been sufficient in attack. That distance did not give the "Fury" pilot time to get his sights on to the enemy. The interceptor pilot has to start thinking several miles earlier than he used to do. The gunner in the day bomber will have to do likewise. Fortunately, if we have another war, we shall not find "Harts" in the enemy's ranks. The great daylight raid of 20 odd "Gothas" over London comes to mind. It was a stately procession, unhampered for all practical purposes by the defensive fighters of the day. That incident at least will never be repeated.

In the War

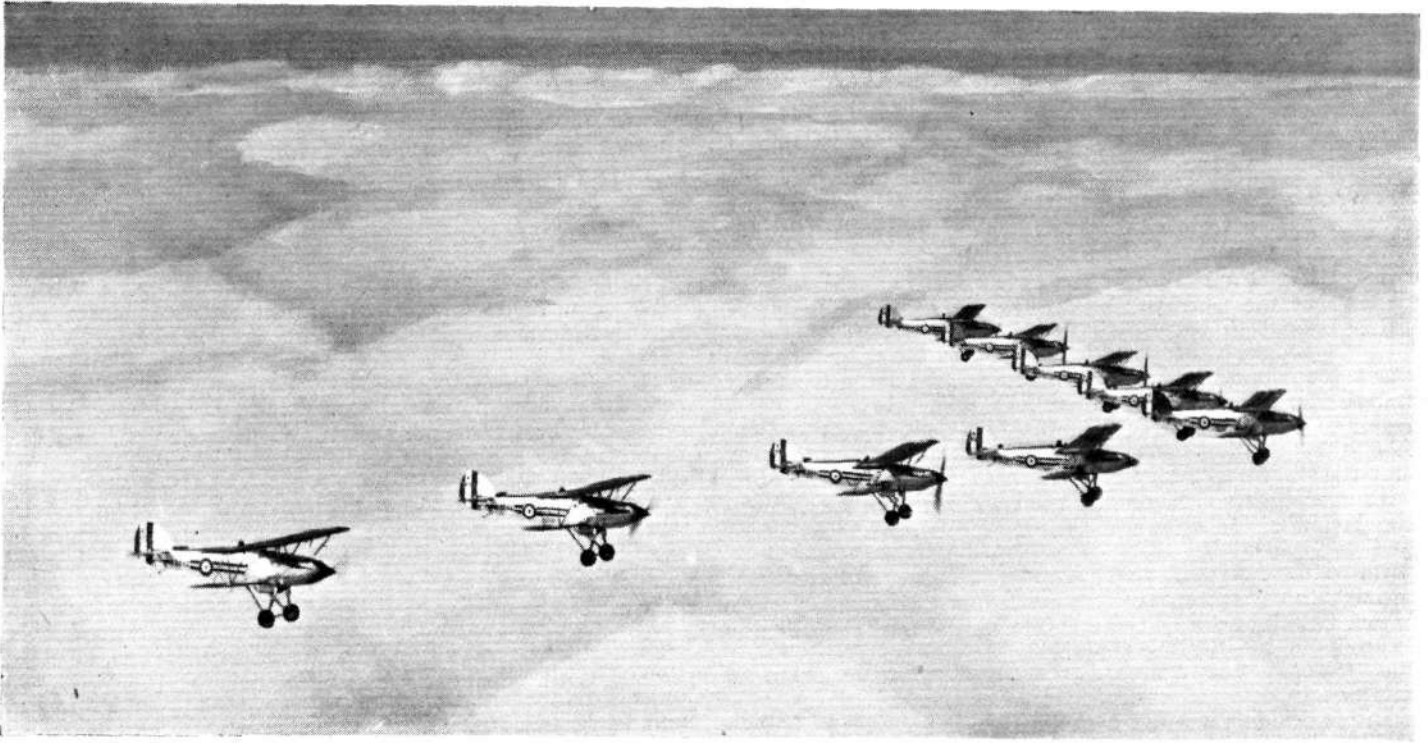
In the Great War No. 25 Squadron played a very gallant part. Its most sensational feat was the killing of the foremost German fighter pilot of the day, Max Immelmann. At the time of his death on June 18, 1916, just before the outbreak of the Somme battles, Lt. Immelmann had been officially credited with the destruction of 16 Allied

machines. He was one of the pilots of the Fokker monoplane which had wrought such destruction among our squadrons in 1915. The original Fokker manoeuvre was a dive from a height, and if that did not succeed in sending the Allied machine down the Fokker would dive out of range before returning to the attack. Immelmann improved on these tactics by discovering the climbing turn, which has been named after him, by which he regained height and attacking position without losing touch with his enemy. His death greatly depressed the German air service at the outset of the Somme, and it was not until near the end of that struggle that Oswald Boelcke, later succeeded by Manfred von Richthofen, succeeded in restoring German prestige in the air. The pilot of No. 25 Squadron who shot down Immelmann was 2nd Lt. C. R. McCubbin, and his observer (they were in a F.E.2.B) was Cpl. Waller. The story of the fight is as follows.

Just before 8 p.m. on June 18, 1916, two F.E.'s of No. 25 went up on patrol together from Aichel Aerodrome. McCubbin was pilot of one and 2nd Lt. J. R. B. Savage of the other. About 9 p.m. they saw three Fokkers over the lines and attacked them. One flew away, while the other two made towards Lens, followed by the two F.E.'s. Immelmann thereupon attacked Savage and chased him down, hitting him with mortal effect, while the observer, 2nd A.M. T. Robinson, was slightly wounded and was taken prisoner. McCubbin followed the Fokker down and fired at it. It turned away from Savage and dived straight into the ground. Of course, the personality of the Fokker pilot was not known until afterwards. McCubbin was himself wounded eight days later, but he had done a service which greatly helped the British forces during the Somme battle when our aeroplanes had matters all their own way, and the German flying corps was at its lowest stage of efficiency.

No. 25 Squadron was formed at Montrose as a training squadron on September 25, 1915, the day of the battle of Loos. Its first C.O. was Maj. F. V. Holt, D.S.O., who afterwards rose to be Air Vice-Marshal and commanded the Fighting Area, when he was killed by a collision in the air. In December of the same year the squadron moved to Thetford in Norfolk, and began to equip with the F.E.2.B two-seater pusher fighter, with 160-h.p. Beardmore engine. On February 20, 1916 it flew from Folkestone (possibly from its future aerodrome of Hawkinge) to St. Omer, and soon after began its work as a fighter squadron on the Western front. On April 1 it moved to Aichel Aerodrome, and became part of the 10th Wing in the 1st Brigade, R.F.C., operating with the 1st Army. Before that, however, Maj. Holt had left to take command of the Home Defence Wing. Maj. Carthew commanded for a few days until on March 15 Maj. R. G. Cherry took over the command.

The early work of No. 25 Squadron was patrols to protect



SQUADRON "V": No. 25 (Fighter) Squadron can fly their "Furies" in any formation. (FLIGHT Photo.)

reconnaissance and photographic machines, in which they worked with No. 27 Squadron. The pilots found with delight that the F.E. could hold its own with the Fokker monoplane, and, in fact, during April, 1916, the enemy aircraft mostly avoided combats with them. The squadron possessed two Bristol "Scouts," and these could do what they liked with the Fokker when they brought it to combat. On April 27, however, four F.E.'s had a long fight with six Aviatiks. No. 25 Squadron broke up the enemy's formation, forced four of them to land behind their own lines, and drove the other two off to the South. Only one of our machines was hit. Two days later 2nd Lt. Lord Doune, with 2nd Lt. R. V. Walker as observer, had a fight with a single Fokker. The weight of fire of the two-seater shot off one wing of the Fokker, and it crashed. The pilot was Baron von Saal Saalfeld, son of the Prince of Saxony, and, of course, he was killed.

In June, 1916, the establishment of the squadron was increased to 18 machines. With this increased strength it took part in the combined air offensive all along the line which preceded the Somme attack. The fight in which McCubbin was wounded was a stubborn affair between five F.E.'s who were returning from a bombing expedition over Henin-Lietard, and five Fokkers. Two Fokkers were crashed behind the enemy lines, while No. 25 Squadron lost two observers killed and two pilots wounded. McCubbin was hit in the arm but landed safely. In July, 1916, the squadron was required to undertake night bombing, and it also began offensive patrols. It was stationed far from the Somme area, but the pressure had to be kept up all along the line to hold enemy squadrons and so prevent them reinforcing those on the Somme. During one of the many fights which ensued Sgt. T. Mottershead, with 2nd Lt. C. Street as observer, shot down a Fokker. Afterwards Sgt. Mottershead was posted to No. 20 Squadron, and after his death was awarded a Victoria Cross.

On November 10, 1916, during an offensive patrol, an enemy formation was seen leaving Douai aerodrome. 2nd Lt. W. S. Shirtcliffe flew over it at 11,000 ft., and when the hostile machines were at 2,000 ft. he dropped a 40-lb. phosphorus bomb timed to explode after dropping 9,000 ft. He got a direct hit on one of the enemy aircraft, which immediately crashed, whereupon the rest of the formation landed again on the aerodrome.

In February, 1917, we find No. 25 Squadron engaged in taking photographs under strong escorts of their own

squadron. They were usually attacked, mostly by Halberstadts, and had to fight hard to get their photographs. In March of that year the squadron began to re-equip with the F.E.2.D., with Rolls-Royce 250-h.p. Falcons, and in June it received the D.H.4 with 275-h.p. Falcon. In the same month Maj. Cherry was promoted to command a wing at home, and was succeeded in command of the squadron by Maj. the Hon. O. M. Guest, a brother of the future Air Minister, Capt. F. E. Guest. Maj. Guest commanded the squadron until September, 1917, when he was succeeded by Maj. C. S. Duffus.

In October, 1917, the squadron moved to Boisdingham and joined the 9th Wing. Its new duties took it on long reconnaissances over the whole British front, for which the good performance of the D.H.4 made it specially competent. The D.H.4 would fly at 20,000 ft., and at that height enemy aircraft were rarely met until the year 1918, when the Germans obtained new types with better performance. The work in the autumn of 1917 was hampered by very bad weather, but so stoutly did the pilots stick to their work that in December, 1917, the following letter was sent by General Trenchard to the 9th Wing:—"Please convey to all pilots and observers of the 9th Wing the great opinion I have formed of their work during these recent operations in weather we should have thought two months ago impossible. It shows the utmost gallantry and determination to have carried out the work."

When the Germans started their last big offensive in March, 1918, No. 25 Squadron moved to Villers Brittonneaux, on the Amiens-St. Quentin road. Other moves followed. In June the squadron received D.H.4's with Rolls-Royce Eagle 8 engines and a few D.H.9.A's with the 400-h.p. Liberty. It is recorded that the oxygen apparatus was not good, and the men suffered from the height at which they flew. When the Allies counter-attacked, the squadron moved forwards, and finally entered German territory with the Army of Occupation. In September, 1919, it flew back to South Carlton, where it disbanded, but immediately began to reform at Hawkinge.

Since the war, its most interesting adventure of No. 25 (Fighter) Squadron (as it had become) was its part in the expedition to Constantinople in September, 1922. For the rest it has always been a most important unit of the Fighting Area of the command Air Defence of Great Britain.

(See page 1178.)



The Tailless Aeroplane

Lippisch considers that its theory is now sufficiently far advanced for the construction of a five-engined freight machine of four tons gross weight to be a practical proposition.

DURING a lecture at the twenty-first annual meeting of the German W.G.L. (which corresponds somewhat to our Royal Aeronautical Society) Herr A. Lippisch, of the Rhön-Rossitten Gesellschaft, outlined the work his firm has done on the subject of the tailless aeroplane, both theoretical and practical. As a result of this work Herr Lippisch has come to the conclusion that of the three possible ways of attaining fore-and-aft stability, sweep-forward plan form, straight wing with stationary c.p. profile, and sweep-back plan form, the latter is the only practicable form. His experiments and tests have led him away from the swept-back plan form with constant chord, and towards what may be termed the "triangular" plan form, *i.e.*, a plan form which has the apex of the triangle in front, the base of the triangle as the trailing edge, and the two acute angles of the triangle cut off to give support for the wing-tip rudders.

In his design for a five-engined tailless monoplane (which may be built some day) Herr Lippisch has incorporated all the latest results of his experience, such as the modified "triangular" plan form, a wing profile with reflex curvature of its centre line, and therefore with stable c.p. movement, the use of slots on the trailing edge flaps, and the splitting up of these flaps into a central one acting as elevator and two outer flaps acting in addition as ailerons. More strictly speaking one should probably say that the central flap is to be regarded as the trimming tailplane.

The Lippisch design is shown herewith in the three-view general arrangement drawings, for which we are indebted to our very excellent German contemporary *Zeitschrift für Flugtechnik und Motorluftschiffahrt*, more generally known by the initials Z.F.M.

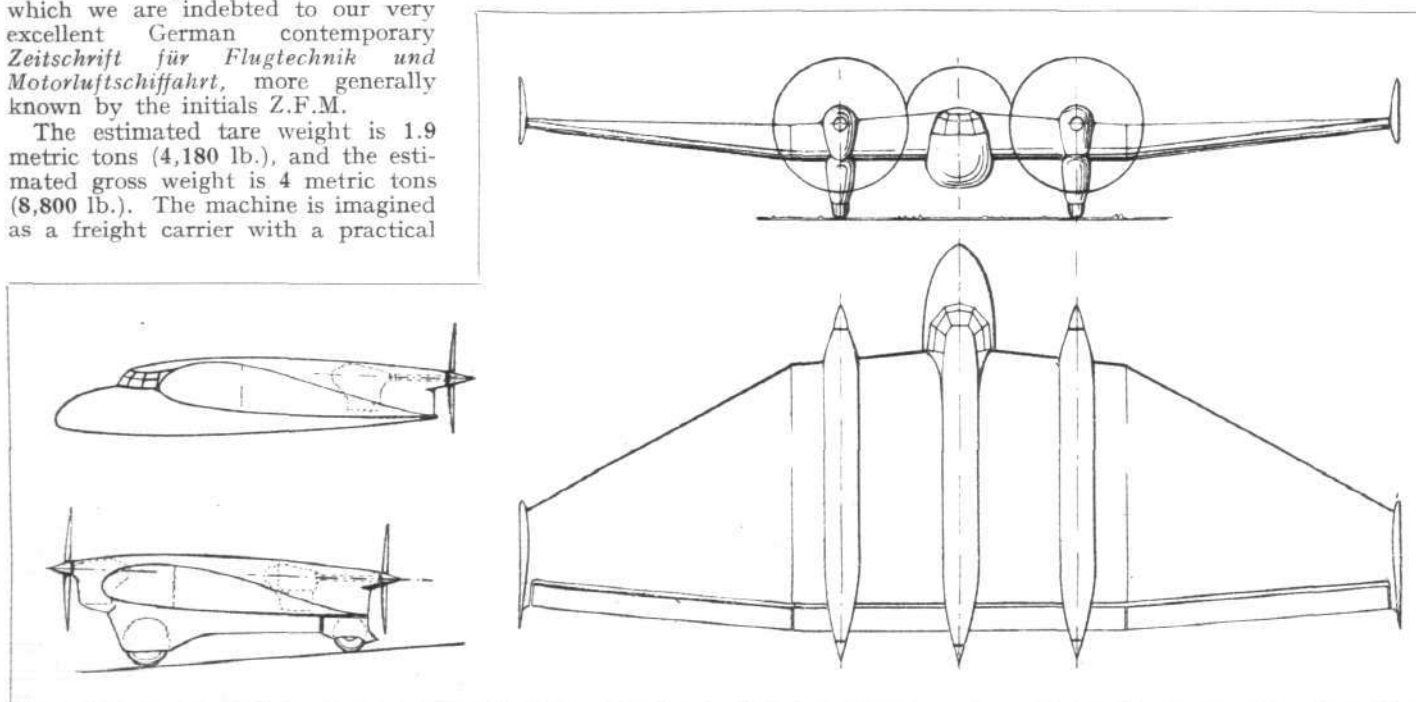
The estimated tare weight is 1.9 metric tons (4,180 lb.), and the estimated gross weight is 4 metric tons (8,800 lb.). The machine is imagined as a freight carrier with a practical

working range of 3 500 km. (2,170 miles). With a wing span of 15 m. (49 ft. 3 in.) and an aspect ratio (span²/wing area) of 4 the wing area becomes 55.5 m.² (597 sq. ft.).

Herr Lippisch suggests that four-cylinder, in-line, air-cooled engines of 130 b.h.p., such as are now readily obtainable from several makers, should be used, and estimates that the practical cruising speed should be approximately 200 km./h. (124 m.p.h.). If greater maximum and cruising speeds are required, he protests against the usual procedure of "piling on more power," and suggests that a retractable undercarriage should be used instead.

In replying to the discussion of his paper, Herr Lippisch mentioned that the old fear of damage to pusher air-screws, through objects being accidentally dropped overboard, had not been found in practice to be a valid objection. In all the cases which had come to his notice, such objects had been caught in the air stream and flung up and back, not striking the propeller at all.

It is interesting to compare the Lippisch design with the Westland-Hill "Pterodactyls," in which the tapered swept-back wings with wash-out of incidence are used. If the small open gaps by the leading edge "shoulders" of the "Pterodactyl" were filled in, the plan form would not differ very greatly from that of the Lippisch design, although the trailing edge itself is swept back slightly, whereas in the Lippisch design the trailing edge is actually sloped forward. Presumably Lippisch relies to a greater extent than Hill on a wing section with reflexed centre line.



Dr. Dornier's Lecture Postponement

THE lecture by Dr. Dornier before the Royal Aeronautical Society on "Lessons of the Do.X," originally arranged for December 15, has been postponed to the second half of the session in order that Dr. Dornier may be able to incorporate some of the latest results of his work. The new date will be announced shortly.

G.A.P.A.N.

A DISCUSSION on "Physical Efficiency as it applies to the 'B' Licence Pilot" is to be initiated by Wing Com. Tredgold, R.A.F., immediately following the meeting of the Court of the Guild of Air Pilots and Air Navigators on December 12 at Williamson's Restaurant, Bow Lane, E.C.2. In the Deputy Master's report for the year ended September 30 issued by the G.A.P.A.N., membership is

stated to be 148 members and 80 associates, 24 of the former and 36 of the latter enrolling during the past year. Concerning the employment bureau, 37 inquiries were dealt with and 22 positions were filled. The question of medical standards is rapidly becoming of primary importance to the older pilots, and the Guild is seeking a means to avoid hardship to them. It is the Guild's contention that declining physical fitness is counterbalanced by greater experience, and that this must be given due weight. The Guild now has its own accommodation, consisting of offices, a reading room and library. A visual signalling apparatus has been installed for the use of candidates for the 2nd Class Navigator's Licence without expense to them. The Guild's Instructor's Certificate has received official approval during the current year.



A "Shot-Welded" Aircraft

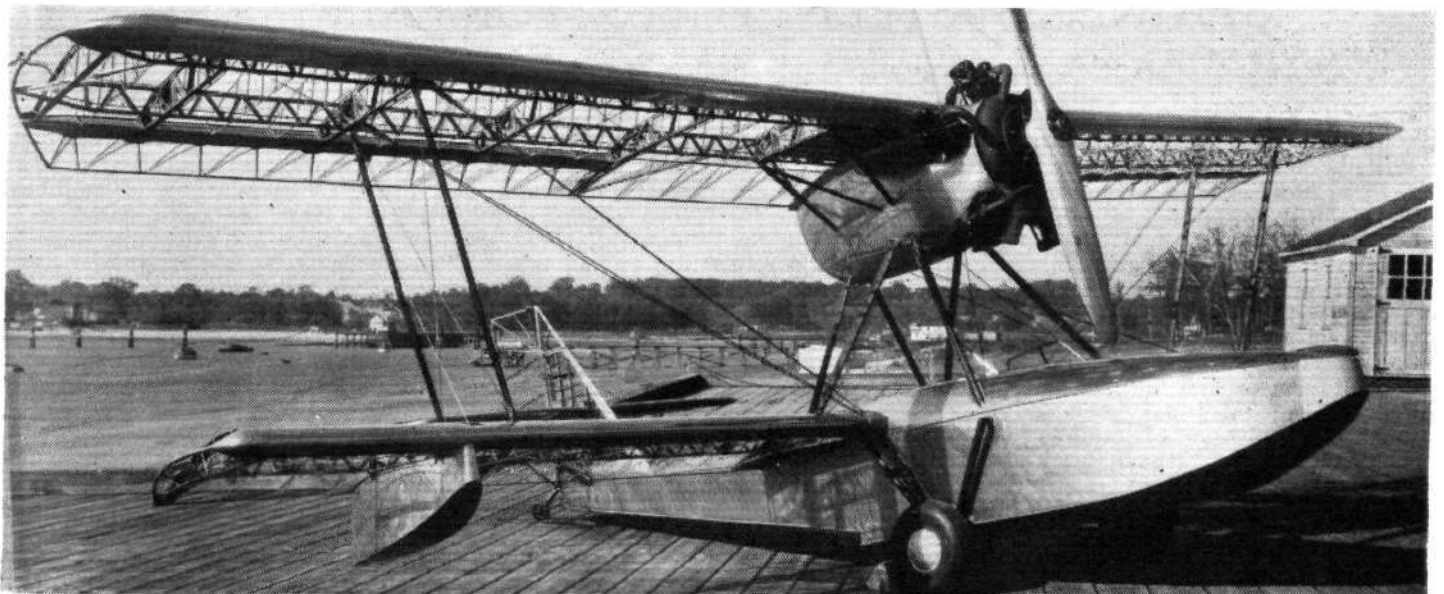
In our issue of October 27, 1932, we published a brief illustrated description of the Budd "Shot-Welding" process. Below is described the BB. 1 amphibian flying boat built by the Edward G. Budd Manufacturing Co., of Philadelphia, for the American Aeronautical Corporation, of Port Washington, New York. This machine, which is built throughout of stainless steel, has all its components joined by the shot-welding process, and is coming to this country shortly, when it will be demonstrated by Mr. Rex Stocken.

FUNDAMENTALLY based upon the Savoia-Marchetti S.31, the American Aeronautical Corporation's BB.1 amphibian illustrated here was altered in certain minor respects in order to facilitate the joining of structural pieces by the Budd "Shot-welding" process. In the main, however, the machine remains true to the original S.31 design in the matter of external lines, and the main interest attaching to it lies in the novel constructional details.

The Budd "Shot-welding" process, described in FLIGHT of October 27, 1932, consists essentially in electric spot-welding of extremely short duration, and the process has the advantages that, as the duration of heating is so

extremely short, the metal surrounding the weld does not become weakened, nor does it lose its rust-resisting properties if stainless steel is the material welded. Moreover, the process is throughout under perfect control, and a permanent record of each weld is automatically registered for later examination and reference. The process is of American origin, but is being introduced in this country by the Pressed Steel Company, of Cowley.

The BB.1 is a small single-engined amphibian flying boat with open cockpit accommodation for four, including pilot. The machine has a wing span of 34 ft., a length of 25 ft., a wing area of 292.4 sq. ft., a tare weight of 1,749 lb., and a normal loaded weight of 2,650 lb., which



SHOT-WELDED ENTIRELY IN STAINLESS STEEL : The BB.1 Amphibian in skeleton. The machine is coming to this country shortly.

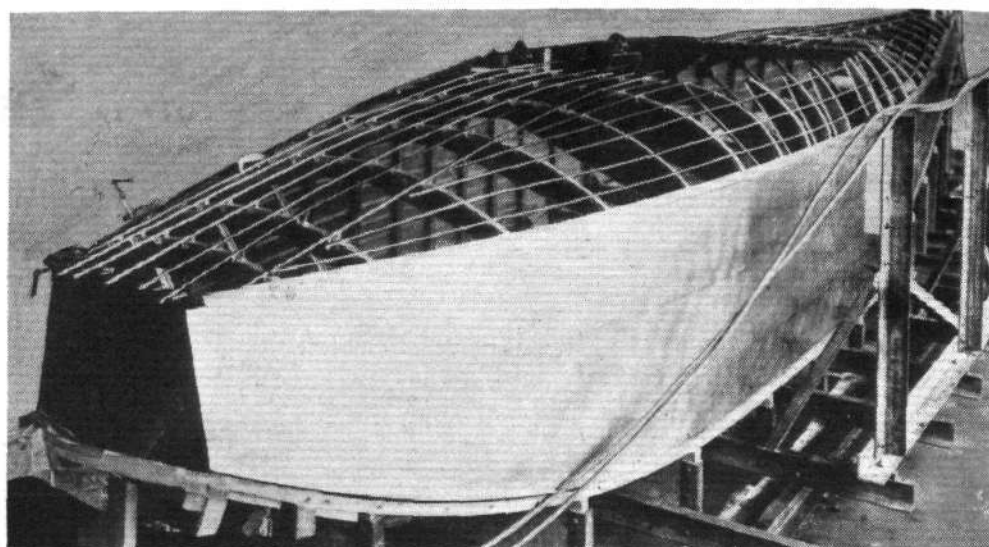
may, however, be increased to 3,300 lb. Fitted with a Kinner engine of 170/200 h.p., the machine has a top speed of 118 m.p.h. and a cruising speed of about 100 m.p.h.

In general outline design the BB.1 is a typical Savoia flying boat, with flat-sided hull and straight-line vee bottom of the single-step type. The engine is housed in a streamline nacelle in the top plane and drives a tractor airscrew. The undercarriage can be raised clear of the water when the machine is used as a flying boat, but is not buried inside the hull or wings. A tail wheel is used instead of a skid, and as it moves with the air rudder it serves as a water rudder for taxiing on the water.

The hull of the BB.1 is built entirely of stainless steel, and consists of an internal skeleton of frames and light longitudinal stringers of U-section, to which the stainless-steel sheet planking is attached by shot-welding. The fact that the hull is of the straight-line type, i.e., with flat sides and a straight-vee as distinct from curved-vee bottom, facilitated manufacture very greatly, as the sides could be welded up "in the flat" on the bench, and later attached to the frames and stringers as complete units. Similarly with the two halves of the vee bottom. These were first welded together as flat sheets on the bench, and afterwards welded to keel and chines. The whole manufacture of the hull must have been very rapid, but whether or not the Budd shot-welding process would be as readily applicable to the construction of a typical British hull with curved lines is, perhaps, open to doubt. Water-tightness is achieved by running solder into the gaps between welds.

The biplane wings are of perfectly orthodox type, with two main spars, Frise ailerons, and the usual interplane struts and streamline wire bracing.

Formed as a Warren girder, each spar is composed of top and bottom flanges of U-section, to which the short ties are joined by shot-welding. The material is, like that used in the hull, stainless steel. It is likely that a wing spar built up in the form of a Warren girder is slightly less efficient than the corrugated box spars habitually used by British constructors, at least for a machine as small as



THE HULL OF THE BB.1: Sides and bottom were assembled as units and then welded to the frames and stringers. The latter are of U-section. Watertight joints were obtained by running solder into the gaps between welds.

the BB.1, but the difference in weight cannot amount to many pounds, and the facility with which such a spar can be manufactured should be worth a slight sacrifice in structure weight.

The wing ribs are also of stainless steel, and are assembled on the bench by shot-welding, being "slid" into place on the spars afterwards. The leading edge is covered with thin stainless sheet, up to the front spar.

Wing-tip floats of usual type are used, and are bolted direct to the lower wing spars by four bolts each. Structurally they are of similar construction to the main hull. The internal stringers of the hull, by the way, are U-section stainless strips similar to those used in the wing spars in order to reduce to a minimum the number of different sections used. In this way, and as a result of the rapidity of shot-welding, the higher cost of stainless steel is somewhat offset, in addition to the other advantages regarded purely as a welding process.

When, shortly, the BB.1 comes to this country, it will be taken on a tour by Mr. Rex Stocken, when doubtless a large number of FLIGHT readers will take the opportunity to examine this very interesting piece of aeronautical engineering.



STAINLESS STEEL TUBES FOR AIRCRAFT

Accles and Pollock, Ltd. Solve Some Difficult Problems

THAT the all-stainless metal aeroplane and seaplane have "arrived," and arrived to stay, admits of no doubt; and since British aircraft, at any rate, have latterly been based to a greater or less extent (chiefly according to size) upon a tubular construction, the history, production and characteristics of the stainless-steel tube are matters which interest and deeply concern aircraft manufacturers.

The production of stainless-steel castings, forgings, strip, etc., were at one time considered difficult, but the production of stainless-steel tubes has been a great deal more difficult. In fact, it is quite safe to say that, if Accles & Pollock, Ltd., had not interested themselves and undertaken the production of stainless-steel tubes for aircraft, no such tubes might have been available to the aircraft industry for a long time.

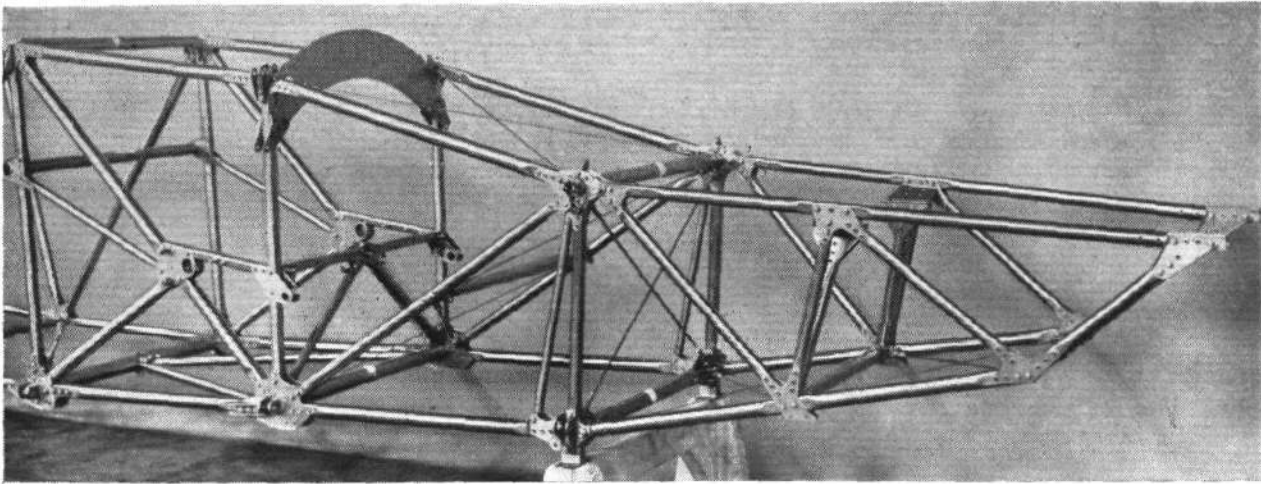
In the first place, the piercing and rolling of the stainless-steel billets present technical difficulties owing to the narrow range of temperature and the strength of stainless steels at high temperatures at which these operations can be performed without introducing forging faults. Even to-day, such faults are not uncommon in the blooms as they reach the actual tube manufacturers. Rigid inspection and a careful cleaning up of all visible faults at every stage are therefore absolutely necessary.

In the next stage—the making of light and high-tensile aircraft tubes—the tube manufacturer finds that his ordinary methods of drawing, lubricating and heat-treating must be revised. In short, the production of stainless-steel aircraft tubes requires a new and more skilful technique all along the line, and it is not altogether surprising to find practically only one tube manufacturer in this country producing these aircraft tubes.

The following data, compiled by Accles & Pollock, Ltd., from their own experience, should be of great value to designers of aircraft:—

As is well known, the general term "stainless steel," comprises two very different classes of steel—the austenitic, with a high nickel content, and the martensitic, with either a low nickel content or no nickel at all.

Austenitic stainless steel can be cold-worked up to a very high tensile strength, but it is not so corrosion-proof in the hard worked conditions as when softened and de-scaled, or polished. On the other hand, the tensile limit of proportionality is so low in the fully softened condition as to render it of no value to the aircraft constructor except for exhaust pipes and pipe lines, in this state. Austenitic stainless steel is comparatively easy to weld, and as it is also easy to manipulate in the softened condition, it is almost ideal for exhaust systems, but only since



FIRST PRACTICAL APPLICATION : Forward portion of a fuselage built in Accles & Pollock stainless steel tubing. (FLIGHT Photo.)

the weld-decay proof type of austenitic stainless steel was introduced. This steel in tube form is covered by specification D.T.D. 207. In the hard drawn condition (*i.e.*, with a tensile strength of 50 tons per square inch) the tube specification is D.T.D. 211, while a third specification, in which it is work-hardened to only about 30 tons per square inch, will probably be required for certain parts, such as tubular rivets.

Dealing with the martensitic stainless steel, there are three specifications: D.T.D. 97, D.T.D. 102, and D.T.D. 105, which cover tubes made from stainless steel, with no nickel content at all, the three specifications defined the "fully softened," the "as-drawn and blued," and the still harder "fully heat-treated" conditions. This steel does not approach the austenitic stainless steel for resisting corrosion, and unless it is highly polished the surface is apt to rust, though subsequent action is generally quite slow. It can be oxy-acetylene welded, but not so readily as the austenitic type, and because of air-hardening in the region

of the weld it is essential to heat-treat after welding. Quite recently a new specification—D.T.D. 199—has been issued for a martensitic stainless steel containing a little nickel (*i.e.*, about 2 per cent.). This steel has a 0.2 per cent. proof stress of not less than 45 tons per square inch and an ultimate strength of not less than 50 tons per square inch. There are no specifications for tubes of this material in the "softened" and "as-drawn" conditions corresponding to specifications D.T.D. 97 and D.T.D. 102 respectively, because this material is inherently stiffer than, and cannot be softened to the same extent as, the straight chromium steels. It is considerably more resistant to corrosion than the martensitic steel without any nickel, and with an approximately equal tensile strength it is therefore probable that D.T.D. 199 will replace D.T.D. 105 in some instances. As regards manipulation, D.T.D. 199 tubes fully softened will not approach D.T.D. 97 tubes in respect of the amount of work that can be done with a single annealing.



R. D. BLUMENFELD AT THE ROYAL AERO CLUB

AT a House Dinner on Wednesday, November 30, with Lord Gorell in the chair, Mr. R. D. Blumenfeld spoke to the members on the subject of "The Press and Aviation."

Mr. Blumenfeld has become, as General Seely so aptly put it, "the Doyen of Fleet Street," and is therefore a very suitable person to speak on this subject. As is so usual with these dinners, the speeches were not so much speeches as intimate talks; it must suffice, therefore, if we give the gist of each speaker's remarks.

R. D. B., as he is affectionately called, thought that aviation really got all that it deserved as news from the Press, and assured the members that if they did not see more of their activities reported in the papers it was entirely their own fault for not helping the newspaper men to greater extent, to get the information they required. He referred to the beginnings of aviation, when, for example, Moore-Brabazon had gone to France in order to avoid having things about him put in the papers, and how even in the early days in America and at Hendon it had been necessary for reporters to hide themselves.

Mr. Blumenfeld's remarks were throughout interspersed with those humorous touches for which he is so well known, but which unfortunately lose their humour when committed to paper. He excused the prominence given to aircraft crashes by saying that they were still news, and that when crashes were a common occurrence they would no longer be worth space. He recalled the time when a burst tyre on a motor-car got half a column, and the motor-car manufacturers used to say exactly the same as the aircraft manufacturers are now saying. Speaking about the development of aircraft in the future, Mr. Blumenfeld envisaged the time when every man would have his own machine, and when even the Government might subsidise the purchase of those machines; but if we judge by the effectiveness of the prophesies made in Mr. Blumenfeld's books, there would seem little chance of this.

The use of horrible words like "airplane" in daily

papers was excused on the plea that it was more English than "aeroplane," but the vociferous noises which arose at once, point to this being a very unpopular assumption.

Mr. Blumenfeld disclosed the fact that he had been chosen by Lady Houston to hold the purse strings of the fund she had so generously started for financing the flight over Mount Everest.

Among those who joined the discussion which followed Mr. Blumenfeld's remarks was Gen. Seely, who is evidently taking his connection with the League of Nations very seriously, and who at once left the question of the Press in favour of a dissertation on the League.

Col. Mervyn O'Gorman backed him up and emphasised the importance to England of aviation development.

Mr. Handley Page was practically unreportable; he waxed lyrical over the "sweet cadence" of the word aeroplane, and then wrung our hearts with the picture he painted of the connection between bombs, aviation and women and children.

Mr. Dismore asked for equality between the newspaper insurance for motor and aircraft travellers.

Sir John Siddeley, in his delightful manner, suggested that we had a lot to thank the Press for, and thought that manufacturers of aircraft were prevented by the Air Ministry from giving much of the news they would like published.

Mr. Lindsay Everard thought that the Club and Aeronautical Societies might help themselves more than they did by giving the newspapers news about their doings, so that the public would know more of the steady work which was being put in for the development of aviation.

Gen. Seely, in concluding the discussion, suggested that someone ought to be induced to put up a large money prize for the pilot who flew most slowly.

Mr. Blumenfeld replied briefly to the various points raised, and thus ended one of the most instructive yet at the same time most amusing House Dinners the Royal Aero Club has had for a very long time.

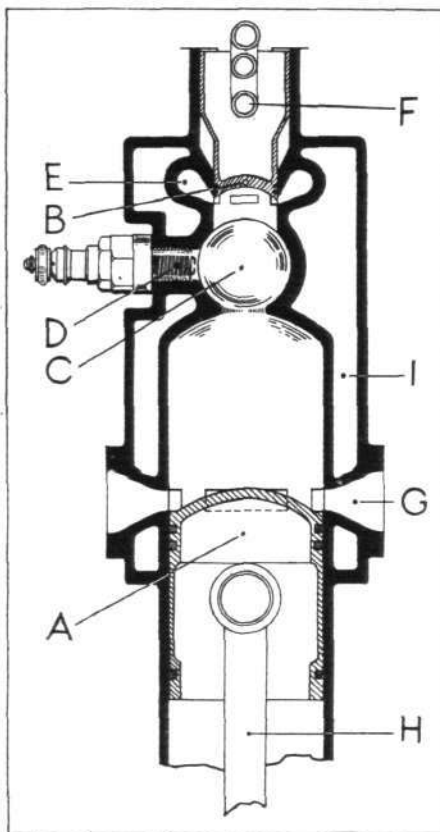
One Hundred Horsepower per Litre!

Further details are given this week of the very promising two-stroke engine which we illustrated and described briefly in our issue of November 10. An aircraft engine of about 240 h.p. is now being considered as the next step from the existing experimental single cylinder unit.

KNOwn as the E.J.J. engine, the experimental single-cylinder unit which has been built at Wallington has caused, perhaps more comment than any other new engine of recent years. Even in its admittedly experimental state, the results so far obtained have been little short of phenomenal, and are certainly such as to warrant very keen interest being taken in the further development of the type.

Messrs. F. Edwards, F. Jearum and J. Jameson have, from the first, taken simplicity of design as their main aim. In doing so they naturally turned to the two-stroke cycle in order to avoid the complication of valves. The adoption of this principle has enabled the general design so to be laid out, that manufacture should be both cheap and easy. Our drawing shows a section of the existing cylinder, and from this it can be seen that the use of a piston valve in the cylinder head, together with cylinder wall ports for both inlet and exhaust, result in a casting which is both straightforward and symmetrical.

In the drawing, (A) is the main piston. This is quite ordinary with a hemispherical head, two compression rings above the gudgeon pin and one scraper ring near the bottom of the skirt. This piston is of light alloy and has massive internal ribbing under the head. (B) is the piston valve which controls the admission of the mixture. The small extension of this carries two compression rings and has a concave head conforming to the shape of the combustion chamber (C). The upper part of the piston valve is of larger diameter, giving clearance for a short crank (F), from a layshaft, to rotate within it. This layshaft is driven at engine speed by a chain, and operates the piston valve by means of a short connecting rod. The lower end of the



A cross-section of the "E.J.J." engine drawn diagrammatically:—(A) piston; (B) piston valve; (C) combustion chamber; (D) sparking plug; (E) inlet ports; (F) layshaft and crank; (G) exhaust ports; (H) connecting rod; (I) water space.

cylinder in which the piston valve works has around its circumference a series of inlet ports (E), and these are uncovered as the valve rises. The design of these ports, in conjunction with the spherical combustion chamber, ensures that the mixture is in an exceptionally turbulent state when it is fired by the sparking plug (D). The mixture is supplied to the inlet ports under a pressure of approximately 8 lb./sq. in. by a blower of the rotor and vane type, which has, after repeated failures of other types, been developed for this engine by the designers.

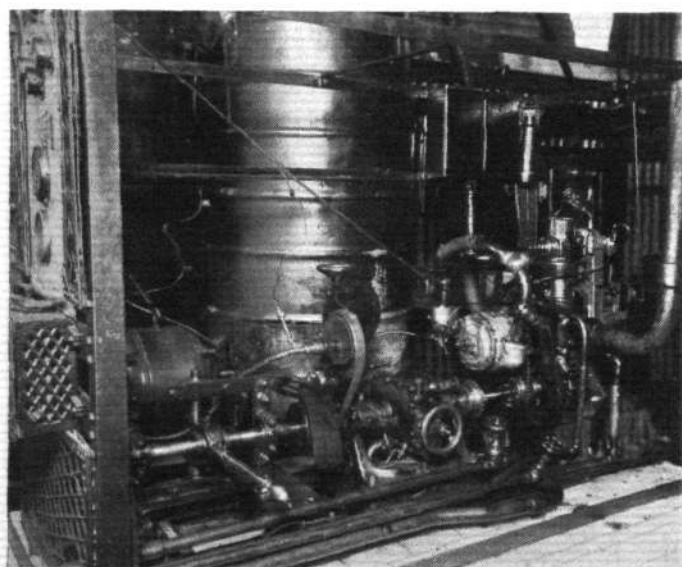
On leaving the combustion chamber the gases reach the main cylinder through a comparatively narrow orifice, giving a venturi effect, which further enhances the turbulence already achieved, ensuring complete and rapid combustion and preventing detonation. It may also have the effect of speeding up the gases on their downward expansion path, thus assisting not only the downward travel of the piston, but also achieving an unusually high degree of scavenge through the exhaust ports (G).

The cylinder capacity of this unit is only 411 c.c., yet the Heenan-Froude brake upon which it has been running shows a b.h.p. of 54 at 5,000 r.p.m.; and this power can be obtained steadily at any time. The high efficiency of the engine may be judged from the fact that the power curve is said to be perfectly straight up to these revolutions; giving 10 h.p. for every 1,000 r.p.m., while the peak of the curve has not so far been reached, although 5,400 r.p.m. have been attained upon occasions. The compression ratio is 7:1 and the

B.M.E.P. 156.4.

We recently had the opportunity of seeing this unit stripped down after it had done some 600 hr. running. Nowhere was there any sign of abnormal wear. An interesting point was the little end of the connecting rod. This bearing around the gudgeon pin gave trouble for a long time until the designers hit upon the idea of replacing the bearing with a unique one formed by having a shallow recess turned on the pin to contain a complete row of needles, where rollers would normally be used. These needles were then covered with a single sleeve, or outer race as it were, which fitted inside the end of the connecting rod. Since fitting this bearing no trouble has been experienced at all.

A study of the accompanying valve-timing diagram shows that the timing which has been finally decided upon as giving the most efficient results, allows the inlet ports to open about 30 deg. before bottom dead centre and to remain open until 90 deg. after bottom dead centre. The piston valve, which, as already described, controls these ports, is so arranged that its most rapid travel occurs at the actual moments of opening or closing, this being a feature which contributes largely to the efficiency of the engine. Even though not a normally aspirated engine, the time taken to open the inlet ports is still waste time in so far as the efficiency of the cycle of operations is concerned. The valve, it will be seen, is also arranged so that its operating mechanism will be on bottom dead centre at the moment when the pressure in the cylinder is greatest, and will therefore give the valve the most support it can against that pressure.

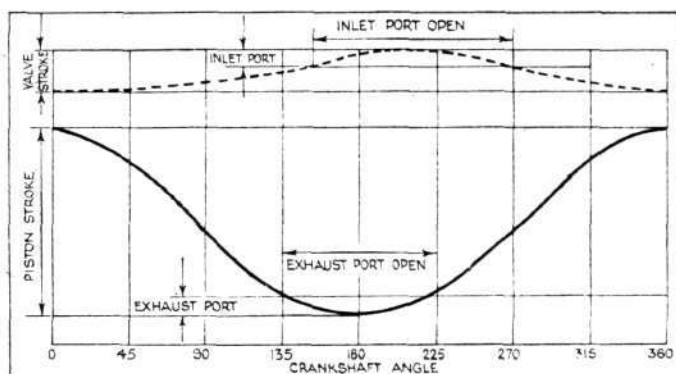


A view of the experimental unit on the Heenan-Froude test brake. (FLIGHT Photo.)

The combination of the cylinder head design, together with the manner in which the charge is introduced into the cylinder, probably accounts for another very desirable feature of this engine, and that is its capability of running very slowly while still two-stroking perfectly regularly.

Of particular interest is the information that negotiations are at present in hand for the construction of an aircraft engine. This is most likely to be a horizontally opposed four-cylinder engine, water cooled and giving in the region of 240 h.p. This power should be obtained from four cylinders of little over 500 c.c. each, which means that the engine will be one of the most compact yet seen. It ought to be laid flat in the wings of a twin-engined aircraft.

A graphical representation of the piston and piston valve movements showing the inlet and exhaust port openings.



Strangling Private Flying

IMMEDIATE ACTION NEEDED

In March, 1930, FLIGHT had prepared a campaign against the irksome and largely unnecessary restrictions with which the private flying of aircraft was surrounded. From many sides we received requests to stay our hand. A special committee was, it was argued, just then looking into the subject, and it was hoped that quite important concessions would be granted by the Air Ministry Departments concerned. An outcry against the then existing conditions might, it was thought, undo all the good that had been or was about to be done. With the future welfare of private flying at heart, FLIGHT resolved to "wait and see." We have now waited two-and-a-half years, and what is the position to-day? Private flying and the construction and marketing of private aircraft are hampered by more and worse regulations than ever before. If steps are not taken at once, the future development of private flying is in grave danger of being throttled.

WHEN, some weeks ago, FLIGHT called attention to the publication of yet another Air Ministry regulation, which had for its subject the prohibition of all experimental flying except that which had received official sanction by the Secretary of State for Air, A.N.D.11 to wit, our postbag showed how generally were shared the views which FLIGHT expressed. It was not that A.N.D.11 in itself was so very much worse than many previous Government regulations restricting the activities of all who fly, but rather was A.N.D.11 regarded as being in the nature of a "last straw." The poor old camel's back is sagging ominously, and unless quite a large number of straws can be removed without delay, this particular ship of the desert is in danger of foundering.

A.N.D.11 is the culminating ignominy of a long series, and in order to show the seriousness of the situation it will be necessary to look back a little, and to examine how it came about that civil flying (as distinct from commercial flying) to-day finds itself in a position which can only be described as intolerable. A.N.D.11 is only one out of very many regulations which the unfortunate builder and user of a private aeroplane have to study, translate into plain English, and then act upon to the best of their ability. But it has at any rate served a useful purpose in bringing matters to a head.

When the war 1914-18 ended, there was no such thing as private flying, at least in the sense we use the expression to-day. Commercial flying also was an unknown quantity. The country, like most other countries, was left with a lot of superfluous and rather useless military aeroplanes, none of which was particularly serviceable for peaceful pursuits. A few were converted into passenger carriers of sorts, and for a few years they did good work, not because they were suitable for the task set them, but entirely because of the heroic determination of the pilots who flew them. The debt we owe to those early commercial pilots is too great to be overlooked nowadays, but it should be realised that what good was done by the early air lines was due to the pilots, who had to fly aircraft unsuited to the work, fitted with engines of far lower reliability than that to which we have now become accustomed.

When this amateurish "commercial" flying had been going on for some time, it was inevitable that the governments in the different countries should begin to sit up and take notice. A wave of optimism swept the world, and commercial aviation was going to revolutionise transport. Conferences and congresses were called, and rules and regulations were drawn up—mostly by people without practical experience of flying—to define the procedure to be followed by aircraft flying from one country to another. Designers in many countries then set to work to produce aircraft specifically planned for commercial aviation, and in Great Britain at any rate the Air Ministry departments which had dealt with stresses, load factors, materials, etc., were given the task of doing the same for civil aircraft. Thus, it will be seen that civil aviation as it has developed in Great Britain since the war has never been able to get entirely away from military influence. We established a "Controllorate" of Civil Aviation, which was changed later into the present less pretentious Directorate of Civil Aviation, but on the technical side the people who dealt with stress calculations, inspection of materials, equipment and the thousand and one things which now have to be officially "approved" before a new aircraft may make a straight hop of 10 ft., were the same as those who did the work on military types. Superficially it may not appear that this would matter very much, and it might be argued that a man who is stressing a wing, for example, does not care whether that wing is for a civil or a military machine, other than that it must have the appropriate load factors. On the face of it this seems plausible. But the attitude of mind among the Government Departments which deal with civil aircraft is actually of very great importance. The Air Ministry insists, and very rightly so, upon "nothing but the best," where military aircraft are concerned. Nothing but the best is therefore good enough, and as the Government is, in this case, the purchaser, it has a perfect right to formulate its own demands. It pays the piper and is entitled to call the tune.

Now let us turn to civil aircraft. The officials steeped in the atmosphere of military aircraft, where cost is not of such importance, are called upon to deal with a type of machine in which first cost is a vital consideration.

Things are done in a way which might not be acceptable in a military type, but which is perfectly sound and practical for a civil aeroplane. The official mind boggles at accepting something which is not "jewelled in every hole," and the result has been that nowadays, when a thing is wanted for an aeroplane, it costs £6, whereas if the same thing were wanted for anything else, it could probably be bought at Woolworth's for 6d. The fault does not lie with the officials, but with the system which has grown up.

When commercial aviation began to get going, it was realised that there must be some form of control. Obviously it would not do to let any Tom, Dick or Harry come along and establish air routes for carrying fare-paying passengers. Like any other vehicle, the commercial aeroplane would have to be up to certain standards, and thus came into being the regulations governing aircraft flying, as the regulations had it, "for hire or reward." In the drafting of these regulations Great Britain did not have an entirely free hand. Where air navigation was concerned, she had to work with other nations, and on many points had to agree to regulations which she did not really like. It was a question of "give and take." Placed as she is geographically, Great Britain cannot send her commercial aircraft very far without the permission and goodwill of other nations. Much harm was done in the initial stages by all countries regarding flying as different from other transport, something for which very special legislation was required. That was the fundamental mistake made, and we have been paying for it ever since. There is no fundamental difference between flying and shipping, and the same type of regulations as apply to shipping could quite well have been applied to flying. There is really no very good reason why the vertical three-mile limit should not apply to aircraft as the horizontal one does to shipping. But that is by the way.

On what we may call the technical side, i.e., stressing, load factors, etc., we had quite a free hand originally.

For several years our requirements were more stringent than those applying in other countries, and one result was that our aircraft had to be built heavier, and consequently might appear to have smaller pay loads than some foreign machines. This was something of a hardship, certainly, but on the whole it was probably not an altogether bad thing. British aircraft built up a reputation for safety and reliability which, in the long run, was probably worth a good deal more than a few extra pounds of pay load.

But just as all the European countries made a fundamental mistake in legislating on the assumption that flying was totally different from other forms of transport, so did we in Great Britain make a fundamental mistake when we failed to differentiate, in the early days of the movement, between commercial flying and private flying. One result has been that the small single-seater light plane is subject to almost the same regulations as the large 40-seater commercial aircraft. To take a simile from marine transport: The dinghy or rowing boat is expected to have been designed and built under conditions almost identical with those under which the largest ocean liner is designed and built. Small wonder that the private aeroplane has become very much dearer than it should be and need be. If a man likes to take a tin tub and push out to sea in it, there is no government authority to prevent him. If the same person designs and builds anything which will get off the ground, he cannot fly it even over his own property without a written permit from the Secretary of State for Air.

However, it is not with the liberty of the individual that we are primarily concerned here, but with the whole system of certificates of airworthiness for private aircraft. Put quite briefly, it can be said that at the present time there are three classes of aircraft firms in Great Britain: Approved firms, unapproved firms, and "disapproved" firms.

(To be continued.)

A Geared Light Aero Engine

When a motorcycle engineering firm enters the aircraft engine market, the interest aroused is bound to be great. Many authorities have contended that those with knowledge of the problems entailed in manufacturing small high speed motorcycle engines, are the logical designers to tackle the production of very low powered aircraft engines. Douglas Motors evidently agree with this theory and it is to be hoped that their new engines will prove them to be right.

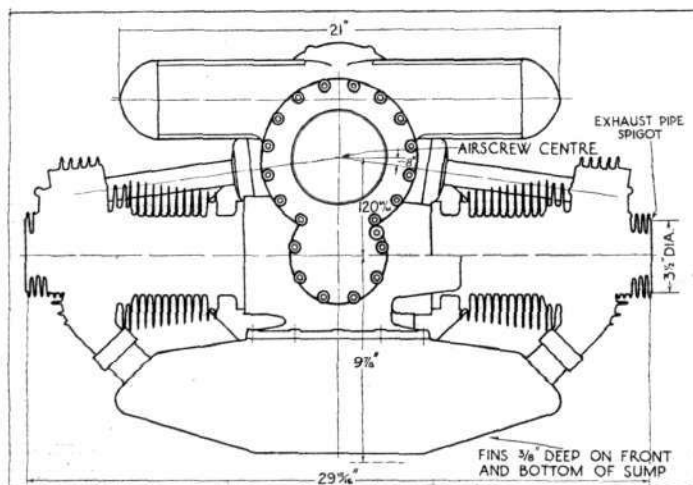
THE revival of interest in really light aircraft has, as we have often pointed out, largely been dependent for its success on the design of a suitable engine. One firm at least, that of Douglas Motors (1932), Ltd., Kingswood, Bristol, has realised this fact and has therefore turned their vast knowledge of light high-speed engines, gained during their many years' experience in the successful construction of engines for motorcycles, to the production of aircraft engines.

They have at present "on the stocks" two models; the smaller, a flat twin air-cooled engine giving about 30 b.h.p., with a direct drive to the airscrew, and the larger, an engine of similar design called the "Dryad."

This will have a capacity of 1,200 c.c., giving 40 b.h.p. at the normal r.p.m. of 4,000, or 52 b.h.p. at the maximum r.p.m. of 4,500. This is a geared engine, with a reduction ratio of 1.8:1, making the maximum airscrew r.p.m. 2,500 or 2,220 normal. The "Dryad" has dual ignition, one of the magnetos having an impulse starter. The valve gear is driven by an overhead camshaft, the mechanism of which is automatically lubricated. Elektron has been made use of wherever possible, and parts like the crankcase and cover plates are all castings in this metal. The cylinder barrels are of alloy steel, heat-treated, while the heads are "Y" alloy castings, with special "Monel" metal valve seatings. The crankshaft and the connecting rods are all of alloy steel, working on ball bearings with pressure-fed lubrication from a Duplex pump. The oil sump is cast integral with the bottom half of the crankcase, and carries a heat interchanger which balances

both the induction pipe and oil temperatures. Smooth running at all speeds has been obtained by the use of a light flywheel, incorporating a torsional vibration damper. The weight, with the No. 0 airscrew boss, is 110 lb., and the price of the engine will be in the region of £125.

The Factory is being approved by the Air Ministry as an Aircraft Engine Factory, and it is expected that both these machines will be through their type test shortly.



An end view of the "Dryad" engine.

From the Clubs

HAMPSHIRE AEROPLANE CLUB'S SEVENTH ANNUAL DINNER

For the seventh year the Hampshire Aeroplane Club held their annual dinner at the South Western Hotel, Southampton, on Friday, December 2, the chair being taken by the Rev. E. Bruce Cornford. After an excellent dinner (but why did the junior members of the Senior Service seek to evade the first two courses?) the chairman having proposed the health of The King, the toast of "The Club" was voiced by Lt. Bentley, who said that the seventh year was reckoned to be the worst by superstitious people, but he would prefer a comparison to whisky, the seventh year of which was the best. The Club's flying hours for the year were 1,536, which resulted in 36 "A" licences. The air nowadays was safer than the road, for too many motorists went into a hotel optimistically and came out misty optically. Because a nation was forging ahead with civil aviation she was not, therefore, against disarmament. Mr. O. E. Simmonds, M.P., in replying, recollected the days when he was a member of the Club before the Club existed (Parliamentary logic). Special thanks were due to Mr. Sheppard, of the *Southampton Echo*, and to the Mayor and Corporation who allowed the Club to use their aerodrome, also they must not forget Sir Sefton Brancker, who had overcome the usual Air Ministry rebuff when the Club was being started. "British Aviation" was the next toast, proposed by the Mayor. He thought that a national air sense was essential; British aviation was supreme in the world; he looked forward to the day when the British Isles could boast as many air routes as did the Continent, and the price of aeroplanes was down to £200. The Corporation were glad that the first use to which their aerodrome was to be put was in providing a home for the Club. Com. Perrin, in replying, suggested that it was time they started dancing, and he thought that the success of civil aviation depended on the clubs. Mr. L. S. Keith Jopp, M.A., in the pleasantest speech of the evening, proposed the health of the guests. He welcomed the Mayor and Mayoress and hoped that ere long the Municipal Chariot would leave the sordid paths of the earth and, like Pegasus of old, be seen cleaving its way through ethereal regions. Also he welcomed Grp. Capt. Quinell and Wing Com. Maclean, who were in the Club's area, they flew the Club's machines but did not return the compliment. Among other welcome guests were Air Com. Barton, Lt. and Mrs. Bentley and Capt. Winters. Air Com. Cave-Browne-Cave returned thanks. The younger members of a club should be cherished, for in their hands was the future of civil aviation. The Rev. E. G. D. Faulkes, M.A., supposed that he had been chosen to propose the Chairman's health on the grounds that it needed a parson to catch a parson. After the Chairman had replied the company retired to watch a really amateur film produced by Mr. J. I. Lansdowne-Wynd and photographed by E. F. Moscham. Dancing followed until well after midnight when the official proceedings ended, though it is rumoured that a certain well-known pilot and his wife entertained a select little band of brighter spirits into the small hours of the morning. Among those present were The Hon. Lady Bailey, D.B.E., the Mayor of Southampton and the Mayoress, Grp. Capt. R. J. F. Barton, O.B.E., Mrs. Beilby, Lt. and Mrs. Bentley, Wing Com. T. R. Cave-Browne-Cave, Mrs. C.B.E., Rev. E. G. D. Faulkes, Mr. and Mrs. W. L. Gordon, Mrs. Hammersley, S. Keith Jopp, M.A., Alderman and Mrs. Kimber, Wing Com. Maclean, Grp. Capt. Quinell, Com. H. E. Perrin, O. E. Simmonds, Esq., M.P., and Mrs. Simmonds, Alderman Mrs. Foster-Welch, J.P., Capt. Winters and Councillor and Mrs. Hector Young.

LONDON AEROPLANE CLUB

If the demand for tickets be any indication, this year's annual dinner and dance should be exceptionally successful. Tickets can still be obtained from the Dance Secretary, London Aeroplane Club, Stag Lane. Saturday's and Sunday's better weather filled the air with club members, and Mr. P. V. Cholmondeley completed his "A" licence tests on the Sunday. Mr. Ogilvie Forbes, the manager of the Craighulgh Meat Co., who ship meat direct from their Scottish estates to the consumer's

dinner table, and who personally holds an "A" licence, wished to supply a further shipment of haggis to the Halton mess in time for a Saturday night celebration. A telegram to Scotland put the delicacy on the night express, a car brought it to Stag Lane, and Mr. Ogilvie Forbes flew it to Halton before dark.

HANWORTH CLUB

Dual instruction has kept the instructors busy during the week, as high winds restricted solo flying. On Sunday, November 27, ten machines flew over to Brooklands for lunch. Lord Apsley's "Parnall Elf," G-AAFH, which has been at the workshops for overhaul, was flown back to Bristol on Friday. Mr. D. Llewellyn and Mr. C. P. Dick made several cross-country flights during the week. Mr. E. Teichman successfully carried out his "A" licence tests, and Mr. G. Cannon flew over to Croydon on Thursday to carry out his "B" licence test.

BROOKLANDS

The "Dawn Patrol"—the pre-breakfast enthusiasts—is once more in action, which shows real enthusiasm on these winter mornings. Mr. Opie is the arch enthusiast, and it is pleasing to note that he is making rapid progress. Mr. Rae Griffin has been doing some amateur aerial photography, while Mr. Young is engaged with "B" licence tests. Among recent visitors were Capt. Findlay, Capt. Preston (in the Parker Pen Co.'s "Puss Moth"), Mr. Frogley, and Mr. Olley on an Airway's "Westland"; a D.H.9 and a "Tiger Moth" also visited the aerodrome, while the Fairey night bomber made several circuits, affording everybody an excellent and impressive sight. Capt. Davis has been to Penshurst, and Messrs. Barr and E. F. Walter, returning from Lympe in the gathering darkness, reported that the improved and brighter neon sign is a useful landmark. Pilots should remember that when this sign is lit right-hand circuits must be made; it is a big letter R situated on the Vickers' hangar. The height judging competition was won by Mr. Hawker-Smith, who will receive free flying instruction on December 3. We welcome back Mr. Lowdell from his flying honeymoon.

CINQUE PORTS FLYING CLUB

During the past few weeks the Club has made the best of the fine days that have been available, and Messrs. Blackden, Dodson, Langdon, Holland and Spiers have taken their "A" licences.

The latest lady pilots are Miss Watts and Miss Savage, who completed their "A" licence tests recently and are now working hard on "putting in the hours." Miss Savage is an 18-year-old Canadian girl, who shows signs of being a real enthusiast as well as a good pilot. Both these ladies went solo under the 12-hr. mark, while the average for men is still good at a little under 10 hr. Mr. Baker went solo last week after only 7 hr. dual, and will pass his tests as soon as there is a fine day. Mr. Stewart and Miss Staples-Smith are both near the solo stage, while Mr. French is awaiting a fine day to do his tests.

The Club will be closed from December 24, 1932, until January 13, 1933, inclusive, for the annual holidays. The manager, Mr. W. E. Davis, is taking this opportunity of a honeymoon, which will be spent in search of the sun south of the Mediterranean.

The Club will be holding the 5th annual dinner and dance at the Royal Pavilion Hotel, Folkestone, on February 3, 1933. The tickets for this will be 10s. 6d. single and 17s. 6d. double, and can be obtained from the Club up to January 16, 1933. If the weather is suitable on the Saturday following, luncheon will be served at the Club, and will be followed by the Club "At Home" and various flying competitions.

NORWICH AND NORFOLK AERO CLUB

The Norfolk and Norwich Aero Club held their Annual Ball at the Spring Gardens, Norwich, on Friday, November 25, which was attended by nearly 300, many of whom had flown from the R.A.F. stations at Hendon, Bircham Newton and Grantham. Parties also came from

the Leicestershire and Ipswich Aero Clubs. Guests included the Lord Mayor of Norwich (Mr. H. N. Holmes), who is the President of the Club, and the Lady Mayoress. The Sheriff of Norwich was also present. The band was the London Adastral Dance Band. Large models of the Club aircraft were suspended from the ballroom roof and the floor was decorated with chrysanthemums and cryptomeria.

LEICESTERSHIRE AERO CLUB

During the month of November 39½ hours were flown, of which 31 were flown in the first 13 days of the month, which figures are proof of the weather conditions experienced. The few visitors by air included Lt. R. R. Bentley, the Midland Aero Club, the Liverpool and District Club, and Mr. Micklethwaite, a private owner, struggling back by easy stages to Yeadon. Messrs. D. G. Henderson and T. S. H. Bailey made their first solo flights. On November 17 Mr. C. Hedley Briggs gave a lecture on "Magnetism and the Compass," and Flt. Lt. Stringer gave a lecture on "Map-reading"; both lectures were well attended. On December 2 the Club held their first dance of the season at the Palais-de-Dance, Leicester. A very enjoyable evening was spent, during which a replica of a "Puss Moth," illuminated, was drawn across a darkened floor (it is to be hoped it complied with the latest Air Ministry modifications). The Club "Jazz" orchestra supplied the music, and are open to accept engagements. Visitors came from the Castle Bromwich Squadron, the Nottingham and Northampton Clubs, and one, Mark Diamant, by air from London.

READING AERO CLUB

In spite of inclement weather during the past few weeks, there has been an increase in the number of flying hours; in fact, compared with the same period last year, the average has increased, which speaks volumes for the popularity of the Club, and the airmindedness of its members. The week-end has been a busy one. Messrs. Collingwood, Bishop, and W. L. James flew over to Brooklands and reported enjoyable trips. The date of the next dance has been fixed for Saturday, January 7, and it is hoped that a cabaret will be staged.

YORKSHIRE CLUB

Four new members have enrolled during the past week. Mr. and Mrs. J. R. Micklethwait made a trip to the Paris Aero Show in their "Moth" G-ABHM, but bad weather delayed their outward journey. The club's annual ball was held on Friday, December 2, at the Hotel Majestic, Harrogate.

SURREY AERO CLUB

The added comforts to the Gatwick club house have proved very welcome on these cold and dismal days. The lounge is generally full during the evenings and during week-ends. Several new members have lately joined the club. Sunday proved to be a really good flying day, and three machines were kept in the air most of the day. Mr. John Speyer has just renewed his "A" licence and is putting in hours at a good pace. Another pupil commences a two-year course with the Redwing Co. on Monday next, and there is also a ground engineering pupil. The club are organising a dance for members and their friends early in the new year.

MAIDSTONE AERO CLUB

On Thursday, November 24, Mr. Victor Smith, while flying from the Cape was forced down near Maidstone airport, and the club sent a machine and refreshment to his assistance. Mr. Smith complained that the English weather was the worst he had experienced during his flight. A.I. has now been repaired after its crash and is in constant use. The monthly average hours are well above normal. The club membership is now over 220, but again let it be pointed out that the entrance fee, which is going to be imposed in 1933, may still be avoided by joining now. On Sunday, December 10, the club's annual dance will be held, and it is hoped that many visitors will take the opportunity of visiting the club. On Sunday, December 4, from 3 p.m., Mr. W. Colyer-Fergusson was "at home" to welcome members and their friends. The club will be open throughout Christmas, and on Tuesday, December 27, there will be a children's Christmas tree. Arrangements have now been

completed to extend the club premises by the addition of a further room, which will serve as a lounge bar, which should, when completed, make the club premises some of the cosiest and most compact in the country.

HERTS AND ESSEX CLUB

At Broxbourne aerodrome last Saturday the club held the first competition for the "Woodside" challenge cup; apart from a high wind the conditions were excellent. The contest was in the form of a "pin pointing" competition over a course of about 40 miles, finishing with a forced landing on the aerodrome, and by lunch time ten competitors had completed the course, three club machines being in action. By 2 p.m., however, rain was falling heavily, the velocity of the wind had not decreased, and the visibility at 500 ft. was nil. The last competitor to take off at 3.30 p.m. was Mr. J. A. Macdonald, the club's youngest member, who completed the circuit at a height of only 200 ft. Mr. G. H. L. Curtis was the winner, with Mr. E. M. Gill a very close runner-up, Mr. L. Walters was given third place. Flt. Lt. Duncanson presented the Woodside cup to Mr. Curtis, who will hold it for six months; he also received another silver cup as a result of his winning a "forced-landing" competition the previous week.

THE SOUTH DOWNS AERO CLUB

Ford aerodrome presented an animated spectacle when we visited there last Sunday. Since the formation of this club the number of members has grown considerably, and there are now some 60, of whom 20 are constantly flying.

The club house is a comfortable building, while the hangar space is, of course, unique. At the present time beside the club aircraft there are also many belonging to the fleet which accompanied the National Aviation Day on its tour of this country, and as well five Ford machines which, although they are well looked after in the hangar, seem somewhat pathetic, standing as they do, and not flying more than very occasionally.

Few aerodromes are situated in more delectable spots than is Ford; and we were not a bit surprised to learn that many of the members came from London, finding it both profitable and pleasant to get away from the City to fly at this peaceful club near the sea.

VICEROY'S CHALLENGE TROPHY

The Committee of the Aero Club of India and Burma are arranging for the annual Air Race for the Viceroy's Challenge Trophy to be held in Delhi on February 10, 1933. This is a handicap speed race, and the course will be over a distance of about 700 miles, to be flown in one day. In addition to the Challenge Trophy, several other trophies and cups can be competed for and about £300 will be distributed in prize money. The race is open to all pilots and any type of civil aeroplanes, and entry forms can be obtained from the Secretary, Royal Aero Club, 119, Piccadilly, London, W.1.

As the race attracts a great deal of attention, it is hoped that owners and aircraft firms from other countries will enter machines. The Aero Club of India and Burma are quite willing to arrange for fully qualified and experienced pilots to fly any machines; also the Club can arrange for the erection of such machines.

LONDON GLIDING CLUB

On Sunday, November 20, the wind blew obliquely to the line of the hill, later changing until it was parallel with it. Hiscox soared for 20 min. in the "Hols," Dewsbery for just over an hour in the "Wren," Collins flying her down twice. Williams flew the "Professor," Buxton soared the "Scud" for about 10 min., and Maj. Petre flew her down; various other people made descents, many of them in ploughed fields.

On Saturday, November 26, Maj. Petre and Dewsbery each did a 20-min. flight. On Sunday, the 27th, the south-west wind was full of vicious bumps, and Collins, doing his first soaring flight in the "Professor," 750 ft. up, was so jerked about in his seat that both belts came undone, and he deemed it prudent to land. The "Cassel" two-seater and the "Wren" were also up for short periods, and F/O. Mole practised approaches for hill-top landings. The Club is extremely grateful to the Maharajah of Jodhpur for his generous and substantial gift to the Club funds. Owing to the absence abroad of Mr. Ashwell-Cooke, Maj. Petre has been unanimously and gratefully elected as his successor in the chair.

Air Transport

THE AIRWAY TO AUSTRALIA

THE report of the inter-departmental committee on Australian commercial flying was published last week. The committee recommend that Australia should assume responsibility for running an air service between Darwin and Singapore. This recommendation affects the proposal of Imperial Airways to carry the service right through to Darwin, and also the proposal of the Royal Dutch Air Lines (K.L.M.) to extend their East Indies service to Australia. The committee also recommend that the service should at first only carry mails and not passengers. Mails from Croydon should reach Brisbane, Sydney and Melbourne on the 17th day, Adelaide on the 18th, and Perth on the 16th. An inclusive fee of 1s. 6d. an ounce is recommended.

The Federal Government have decided to accept most of the recommendations of the report. The route from Singapore is to be over Sumatra, Java, and Timor, with stops at Batavia, Sourabaya, Bima, and Dilli.

The Government have also come to a decision on the reorganisation of the internal services, and have decided to call for tenders for:—(a) A line from Darwin through Cloncurry and Charleville to Cootamundra, with branches from Cloncurry to Normanton, and from Charleville to Brisbane. From Cootamundra the mails would be taken on to Sydney, Melbourne, and Adelaide by train; (b)

a line Darwin, Katherine, Perth, with a branch to Wyndham; and (c) a line between Melbourne and Hobart.

The first of these lines is practically the same as the old Qantas route, the second follows much the same line as the original West Australian Airways service, while the Tasmania service was recently operated by Australian National Airways. Under this new scheme the service between Perth and Adelaide will become superfluous, and will be discontinued.

The Federal Government expects that the air service between England and Australia consequent on the new plan will be regularly established at the beginning of 1934. It is arranging for a Defence officer to survey the route from Darwin to Singapore with an English airman who is flying to England. It is reported that tenders for aeroplanes for the Australian section of the proposed air service have been called for by the Federal Government, and that the plans for the tenders do not stipulate any type of machine, and the Government has made the terms very open in order to enable the most suitable to be chosen. The primary requirement of the Federal Government was a mail service, but if the contractors desired to carry passengers and could do so without impairing the efficiency of the mail service, so much the better.

Indian Air Mails

OUR Indian correspondent writes that the new Karachi-Bombay-Madras air mail service threatens to become a serious rival of the Delhi Flying Club's Karachi-Jodhpur-Delhi air mail service, which had till recently held the monopoly of carrying India's internal air mail letters. The Delhi Flying Club's planes used to carry more than half the total weight of the mails for Bombay and places beyond, but now that Bombay has direct air service the volume of its air mails is bound to increase to the detriment of the Karachi-Delhi service, which was serving Bombay hitherto, by way of fast train connection at Jodhpur. The Delhi Flying Club is therefore likely to lose the support of Bombay, which has been its principal client. This is indicated by the fact that the mails carried by Tata's plane for the first time amounted to 111 lb., which was nearly double the average weight sent to the same destination hitherto via Jodhpur and Delhi. The air mails carried by the Karachi-Delhi service dropped to almost 50 lb. from nearly 120 lb. carried in the previous week, a reduction of 60 per cent.

Atlantic Air Services

It would seem that regular air services across the Atlantic are not far distant. As previously reported in FLIGHT, Pan-American Airways has been looking into this problem for some time past, and it is now announced that this company has signed contracts for the construction of

two "giant" flying boats capable of carrying commercial loads over the trade routes of the Pacific and Atlantic. These machines will be the nucleus of a fleet of six to be built by the Sikorsky Aviation Corp. and the Glenn L. Martin Co., the specifications for which were drawn up under the supervision of Col. Lindbergh. It is stated that they will be capable of flying 2,500 miles non-stop with 50 passengers, mail and freight, at a speed of 125 m.p.h. According to reports, it is expected that the service will be started two years hence, the normal route probably being by way of Bermuda and the Azores, or during the summer by the Great Circle route via Newfoundland and Ireland.

Record India Air Mail

THE greatest load of Empire air mail ever carried left Croydon for India on December 4. The mail weighed nearly a ton, which, taking the Post Office average of 36 letters to the pound, was equivalent to over 80,000 letters.

Air Mails to Scandinavia

THE Postmaster-General announces that, owing to a change in the time of departure of the aeroplane, the latest time of posting air mail correspondence for Denmark, Finland, Holland (first despatch), Norway and Sweden will during December be 6 a.m., instead of 7.15 a.m., at the General Post Office, London, and correspondingly earlier elsewhere.



FOR NEW ZEALAND SERVICE: A Saro "Windhover" flying boat used for the Victoria-Tasmania trip.

Airport News

CROYDON

THE remarkable progress made in commercial aviation is revealed by a comparison of the following figures, showing the total number of passengers who flew in and out of Croydon during each of the last seven years:—1926, 24,859; 1927, 28,507; 1928, 42,964; 1929, 47,838; 1930, 43,234; 1931, 45,208; 1932, 65,494 (up to the end of November). In 1930 the American tourists' slump caused a fall in the figures of nearly 5,000, but since then the increase has been made up to a great extent by British travellers, and to-day about two British subjects pass through the airport to every alien. It is expected that the total for 1932 will reach 70,000.

Football teams are realising the advantages of air travel. On Tuesday the French Soccer team arrived by Air Union from Paris to play a match on Wednesday with the Arsenal F.C. They returned to Paris the following day by the same route.

Ill luck befell Mr. P. E. G. Sayer, of the Hawker Aircraft Co., on Wednesday, while returning from the Paris Aero Show. He was flying a Hawker "Hart" machine and left Le Bourget at 12.55 p.m., but returned owing to weather at 1.40 p.m. Shortly afterwards he made another start and landed this time at Le Zoute, where he spent 15 min. before setting off again. Following his departure from Le Zoute there was no news of him until a message was received at Croydon at 5.25 p.m. to the effect that he had been picked up in the Channel by a small fishing vessel off the Belgian coast. Mr. Sayer made a valiant attempt to save his life by swimming in the bitterly cold water from his sinking plane to the side of the boat where he was taken aboard.

On Friday, December 2, Roy Fox and his band made a journey to Brussels in an Imperial Airways air liner. They played at a performance at the "Agora" Cinema before

Their Majesties the King and Queen of the Belgians and returned to London by air the next day.

One of the earliest pioneers to enter into the spirit of flying with his band was Mr. Jack Hylton. Some years ago he took his band up in a Handley Page W.10 with all their instruments, including a piano, and played popular dance songs in the air. It may have been on this occasion that Mr. Hylton created his well-known song "Me and Jane in a Plane." But flying has long since ceased to be a novelty with dance bands, and the use of the Continental air services has proved to be their most satisfactory means of transport. Not only is the minimum amount of time spent in travelling, but the conveyance of their instruments by air eliminates unnecessary handling, consequently the journey can be made in perfect ease. It has been known for a dance band to record for a gramophone company in the morning, fly to a town on the Continent in the afternoon, fulfil an engagement there in the evening and be back in London early the next day, by using the ordinary air services.

"Hermes" engines at the Paris Aero Show have created a very favourable impression among foreign manufacturers, and it is expected that the already large overseas trade of the Cirrus-Hermes Engineering Co., Ltd., will soon be considerably increased.

The long-range "Hermes II Avian" belonging to Mdlle. Boucher was delivered to her in Paris by the repair section on Sunday, the 4th.

A new air service between Heston and Cowes, I.O.W., is to be inaugurated next April. The service will be operated by 10-seater Spartan "Cruiser" aircraft fitted with "Hermes IV" engines.

The total number of passengers for the week was 1,030; freight, 50 tons 5 cwt. "HORATIUS."

FROM HESTON

MONDAY, November 28.—Several private owners returned from week-end air trips.

Tuesday, November 29.—Mr. Lucas returned from the Paris Aero Show in the Hawker "Hart" ("Kestrel"), G-ABMR, having made a remarkably quick passage.

The large room in the eastern wing of the club-house has now been fully equipped as a games room, where pilots and other members of the club will find much to amuse them during weather that is unfit for flying. There is a good outlook over the aerodrome, and refreshments can be obtained there, so that altogether it is not a bad spot to spend a half-hour or so. A ping-pong tournament is about to be started, which has many entrants.

On Friday, December 2, Mr. K. Whittome left in his "Moth" ("Gipsy III") for Paris. The Marquis de Chateaubrun arrived from Paris in his "Moth," F-ALQA, with one passenger. Flying instruction started early and was carried out continuously until past noon, when a drizzle set in and forced it to terminate for some time. But one of our old pupils, in the person of Mr. S. V. Appleby, arrived, having travelled by air line from Paris, and waited for the return of Capt. Baker from his medical board (he passed A1) to have some dual instruction.

On Saturday, December 3, Miss W. Spooner was off early in "Puss Moth" G-ABDM for Ratcliffe. Among the visitors this day was Mr. Victor Smith, the young Australian who flew from Cape Town to Croydon. Mr. Ahrlers left for Antwerp in a "Moth."

On Sunday, December 4, two ladies set off in a "Moth"—the private property of one—for Paris. We have good reason to believe they are flying much farther afield, but their modesty forbids our mentioning names. A very keen private owner—a busy member of the medical profession—was off early to take advantage of the fine weather, leaving for St. Ingelvert, from where he returned later in the day.

Visitors were innumerable; among those arriving by air were Mr. and Mrs. Crammond in their well-known "Klemm," Mr. Hayter in his "Puss Moth," Mr. Desoutter with his young son as passenger, and Mr. Ince in his "Widgeon." Mrs. Spencer Cleaver left for Paris in her "Puss Moth." Mr. Ahrlers arrived from Antwerp. Mr. G. Selfridge, Jnr., and Mr. Hamish Hamilton left in the former's "Puss Moth" for Cambridge to visit their old college.

Mr. Geoffrey Ambler has placed an order with Brian Lewis & Co. for a "Monospar."

Royal Air Force Squadrons (See p. 1167)

Other descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in FLIGHT as follow:—

H. M. Aircraft Carrier *Glorious*. May 16, 1930.

No. 4 (Army Co-operation), South Farnborough; No. 17 (Fighter), Upavon;

and No. 33 (Bomber), Eastchurch. June 27, 1930.

No. 601 (County of London) (Bomber) Sq., A.A.F. (at Lympne). August 15, 1930.

No. 43 (Fighter) Sq. (Tangmere). September 19, 1930.

No. 2 (Army Co-operation) Sq. (Manston). December 19, 1930.

No. 101 (Bomber) Sq. (Andover). April 24, 1931.

Nos. 204 and 209 (Flying-Boat) Sq. (Mount Batten). June 12, 1931.

"1890-1912-1931." (A brief Outline of the Growth of the Royal Air Force). June 26, 1931.

Cambridge University Air Sq. (at Old Sarum). July 10, 1931.

Central Flying School (Wittering). July 17, 1931.

Oxford University Air Sq. (at Eastchurch). August 7, 1931.

No. 600 (City of London) (Bomber) Sq., A.A.F. (at Tangmere). August 21, 1931.

No. 605 (County of Warwick) (Bomber) Sq. (Castle Bromwich). April 1, 1932.

No. 40 (Bomber) Sq. (Upper Heyford). May 13, 1932.

Nos. 7 and 58 (Bomber) Sq. (Worthy Down). June 10, 1932.

A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet. June 17, 1932.

Oxford University Air Sq. (Eastchurch). July 22, 1932.

Cambridge University Air Sq. (Netheravon). August 5, 1932.

No. 1 Air Defence Group (Auxiliary Air Force and Cadre Sqs.). August 12, 1932.

No. 100 (Bomber) Sq. (Donibristle). August 19, 1932.

Scotland's Auxiliaries; No. 602 (City of Glasgow) (Bomber) Sq. and No. 603 (City of Edinburgh) (Bomber) Sq. September 16, 1932.

London's Auxiliaries. Camps in Kent and Sussex.

Airisms from the Four Winds

Mrs. Mollison Flying Home

MRS. J. A. MOLLISON (Miss Amy Johnson) has cabled her husband from Cape Town to say that she hopes to leave on her return flight on Sunday, December 11. The "Gipsy Major" engine of her "Puss Moth," *The Desert Cloud*, has been overhauled and all is now ready for her return flight. She will have the advantage of the December full moon and will return *via* the West Coast route. She intends to try and fly back as quickly as possible, and if all goes well she may reasonably be expected to land in London within a week. The present record for the homeward flight stands to the credit of Capt. C. D. Barnard and the Duchess of Bedford at 11 days. Mr. Victor Smith, the 19-year-old South African airman, just failed by half a day to break this. Miss Johnson may lower it by a comfortable margin if good luck attends her.

D.H.84s for Hillman's Airways

MR. E. HILLMAN hopes to take delivery of the first of his fleet of D.H.84s on December 20. It is intended to name these machines after Essex villages, the first being named *Maylands*, and should Mrs. Mollison be back in England from the Cape in time she will perform the christening ceremony at Maylands Aerodrome.

New Type Aircraft for the Everest Flight

THE flight which is being organised by the Marquess of Clydesdale, and which has been made possible by the generosity of Lady Houston, will, it is understood, be made on Westland Aircraft machines, with Bristol "Pegasus" engines. The Westland P.V. 3—G-ACAZ—has been purchased by the Committee, and negotiations are in progress for the purpose of obtaining another aircraft of a type used in the R.A.F. The P.V. 3 is a high-altitude machine which, with the "Pegasus" engine, should have no difficulty in surmounting the mountain and enabling the desired photographs to be secured.

Prince George Opens Polytechnic Extension

ON December 2 the new extension building of the Northampton Polytechnic Institute was officially opened by H.R.H. Prince George. The chairman of the governing body, Mr. H. A. Game, welcomed the Prince, and recalled that the Northampton Polytechnic had previously been visited by the Duke of Connaught and, during the war, by His Majesty the King. Prince George referred to the importance of sound technical training, and particularly during difficult times like the present, and then made a tour of inspection of the new building, which is opposite the old main building, on the other side of St. John Street, and which will contain the chemistry, watch and clockmaking, furrier, lens workshop, and automobile laboratories, while a number of class rooms and lecture rooms are available for general use. During the evening it was announced that the Duke of Connaught had consented to the new extension being named Connaught Building. The Principal of the Northampton Polytechnic, Mr. S. C. Laws, afterwards gave an account of the work of the past session, and pointed out that the number of students had more than doubled during the last few years. Prizes were afterwards presented to students by Mrs. Game, wife of the chairman of the governing body.

Sir Alan Cobham's Circus

A LARGE crowd witnessed Sir Alan Cobham's Circus give a display at Capetown airport. The show included the first "Autogiro" seen there. Sir Alan will continue at Capetown for a few days, after which he will commence a tour of the country.

Arctic Trapper Flies to Hospital

ALEXANDER AUSTON, who, with a companion, has spent three years in the Arctic trapping white and silver fox, is now on his way home to Scotland. He has been through severe hardships, and at one time was suffering so badly that the natives who were looking after him sent for an aeroplane, which flew him 1,800 miles to hospital.

Long-Distance Flights

DURING the past 12 months aircraft of the R.A.F. covered about 47,263 statute miles in overseas flights. The greater part of this mileage has been made by flying-boats, notably a flight of No. 205 (F.B.) Squadron from Singapore to the Andaman and Nicobar Islands and back. No. 14 (Bomber) Squadron toured the East African Colonies last spring, a flight of over 8,000 miles.

Control of French Naval Aircraft

AFTER four years' dispute it has been decided that the Ministry of Marine will have control over all co-operation and reconnaissance formations and over certain torpedo and bombing formations. Fighters, the majority of bombers, bases and stores will come under the control of the French Air Ministry, but the personnel employed in these groups will be allowed to choose whether they serve under the Ministry of Marines or the Air Ministry. Although the Air Ministry has been in existence since 1928, its status has never been properly defined, which has given rise to much unnecessary dispute, and made important matters difficult to settle.

Iraq

IN the House of Commons on November 16 Mr. Mander asked the Secretary of State for Foreign Affairs whether he could give an undertaking that the Royal Air Force in Iraq, under the new treaty of alliance, would only be made use of to provide for the safety of British connections, and in no circumstances for demonstrations or actual operations in aid of the Iraq Government in internal affairs. The Prime Minister, in reply, said that British forces were maintained in Iraq for no other purpose than those set out in Article 5 of the Anglo-Iraqi Treaty of Alliance of June 30, 1930, namely, to assist in the protection of British communications and to facilitate the discharge of the obligations undertaken by this country under Article 4 of that Treaty. His Majesty's Government in the United Kingdom had no obligations in regard to the maintenance of internal order in Iraq, the responsibility for which rested solely upon the Iraqi Government, as was expressly recognised in Article 5 of the Treaty. Were the Iraqi Government to ask at any time for assistance not contemplated by the Treaty of Alliance, the situation would have to be considered in the light of the various factors existing at the time.

Group Capt. Busteed

THE retirement of Group Capt. H. R. Busteed, O.B.E., A.F.C., at the age of 45, removes another pre-war member of the R.F.C. from the active list. He was among the first hundred qualified pilots in England, his Royal Aero Club certificate being 94. Group Capt. Busteed, born and educated in Australia, began to learn to fly with a Blériot machine in Melbourne in 1910, and in 1911 came to England, where he was one of the early instructors and test pilots of the Bristol Aeroplane Co. He was commissioned in the R.F.C. in January, 1913, and subsequently joined the Naval Wing. During the war he served at the R.N. Air Stations at Grain and Westgate and afloat in the carriers *Hermes* and *Engadine*, being awarded the O.B.E. and A.F.C. and the French Croix de Guerre. After the war he was granted a permanent commission in the R.A.F. with the rank of Wing Commander and was promoted to his present rank in 1928. His most important piece of work in recent years was to re-form No. 10 (Bomber) Squadron at Upper Heyford.

R.H.S. Medals

THE Bronze Medal of the Royal Humane Society has been posthumously awarded to the late Lt. P. L. H. D. Irven, R.N. (F/O., R.A.F.), for attempting to save, on April 25, Midshipman Archibald Hamilton, of the Royal Navy. An aircraft with Lt. Irven as pilot and Midshipman Hamilton as passenger was forced into the sea off the west coast of Malta, and drifted to within 30 yd. of a high rocky cliff. Some Maltese farmers let down a rope, and the officers made three unsuccessful attempts to reach it. Lt. Irven, the stronger swimmer, was apparently unwilling to leave his companion, and helped him to regain the wreckage after two attempts. During the third attempt the aircraft sank, and both officers were eventually drowned. Lt. Irven could have made a much greater personal effort to save himself if he had been alone.

New American Air Brakes

A NEW type of aeroplane, designed by Mr. John J. Northrup, has been given its final tests by Maj. Frank Hawks. The machine possesses a new system of air brakes and, with a speed of 180 m.p.h., is capable of landing at about 40 m.p.h. The essence of the design seems to be a system of flaps built into the wings which can be dropped to a 60 deg. angle, thereby exerting a powerful drag while keeping the aeroplane flying at a low speed.

THE R.A.F. DINES THE TRADE

EVERY year, as has now become custom, the Commanding Officer of the Aeroplane and Aircraft Experimental Establishment at Martlesham Heath gives a dinner to members of the aircraft trade. These dinners started more or less as a sort of glorified Guest Night, but have now become full-dress occasions of no mean importance.

On December 2 this year the Commanding Officer, GRP. CAPT. H. L. REILLY, as chairman, expressed the view that these dinners did a great deal to further the close relationship existing between the R.A.F. and the aircraft contractors. He referred to the fact that among the guests were many pioneers of flying, including Sir Alliott Verdon-Roe, who made his first and historical flight more than a quarter of a century ago.

MR. C. R. FAIREY, Managing Director of the Fairey Aviation Company, asked for an expression of the appreciation which he was sure everyone felt for the hospitality being extended to them that evening. With regard to the work done for the contractors by the officers at Martlesham Heath, Mr. Fairey said that it had done a very great deal to establish a standard whereby all other air-

craft in the world were measured. He also mentioned the recent speeches of Sir John Simon, and said that he thought the D.T.D. would be very overworked as soon as the next war started if the suggested limit of 6,300 lb. for aircraft was adhered to. He thought that perhaps one solution would be for the pilots all to be weighed in like jockeys.

MR. HANDLEY PAGE, Managing Director of Handley Page, Ltd., made one of his renowned humorous speeches, interspersing his far-sighted observations on matters aeronautical with stories which, while causing much laughter, were somewhat outside the scope of aviation. He felt that the aircraft industry owed a very great deal indeed to the commanding officer and officers of Martlesham Heath, for they had, in his experience, always been most helpful and had done everything in their power to assist in spreading the gospel of aviation.

Others who spoke included Mr. John Lord, Managing Director of Saunders-Roe, Ltd., and Mr. C. G. Grey. The former's well-known Lancashire dialect was used to the full to entertain those present, but he, like the other speakers, made very little reference to aviation in his talks.



THE DE HAVILLAND DINNER

AFTER an interval of two years, the De Havilland Aircraft Co. again held their annual dinner at the Wharncliffe Rooms on December 3. The De Havilland Co. is unique in many ways, not the least of which is the number of successes which they can claim for their aircraft. It was all the more striking, therefore, to have a programme of the evening presented to each guest which contained no less than eight pages, filled with a list of these achievements. We could not help wondering whether any other company could show such a record as this.

MR. T. P. HAWKINS, of the Engine Test Department, very ably proposed the toast of "The Directors and Management." On behalf of the employees he congratulated the directors and management on designing the "Moth," a machine which, he said, they were all proud to produce. The success of this machine and its subsequent versions had been the means of giving them steady employment—a matter of paramount importance to them—and it was therefore only too certain that he was voicing the feelings of everyone when he asked that successful machines of this type should continue to be produced. A matter of gratification to the employees was the way in which the management was always ready to help them with their troubles, not only in a direct and personal way, but also by the provision of places like the new canteen and club-room, besides funds like the superannuation and sick funds. The employees' health had always been most carefully looked after, and that was another of the things for which they had to be grateful.

MR. A. S. BUTLER, Chairman of the Company and of the dinner, said that the abandonment of last year's dinner had been inevitable owing to the state of trade generally, but he was glad that they had been able to hold it again this year, as it was undoubtedly a means of bringing the staff and the works into closer co-operation. He referred to the superannuation fund, which had been the means of providing employees, who had been forced to leave the company's service, with sums up to £90. Last year the financial position of the fund was not too strong, but now the Government securities held by the trustees stood at a value of £1,850 above their purchase price.

Mr. Butler spoke of the success of the "Fox Moth," and also the "Gipsy Major" engine, both of which had made their *début* this year. The D.H.84 was also something of an achievement, as the design was not started until September, yet the first machine was flying on November 24, incidentally exceeding expectations when doing so. Special mention was made of the Service Department Staff, who were to be congratulated on the way they carried out their particularly difficult jobs.

Over 75 per cent. of the firm's total business was done abroad last year, deals being made with the following countries:—U.S.A., Roumania, Switzerland, France, China, Holland, Portugal, Brazil, Belgium, Italy, Japan, Poland, Norway, Iraq, Egypt, Germany, Morocco, Sweden, Denmark, Persia, Colombia, Czecho-Slovakia, Australia,

Canada, India, New Zealand, and South Africa. Mr. Butler felt that the Company was helping their fellow-countrymen more by increasing this foreign trade than by any other means in their power. In South America, for example, the firm's representative there, Mr. W. H. T. Ballantyne, had sold 69 machines in the face of severe competition from France and America.

Referring to the Persian contract, which was now virtually completed, Mr. Butler said he would like to take the opportunity of thanking Capt. J. H. Cheybani, together with his associates, Capt. Issa Kahn Staudach, Lt. A. Farzad, and Lt. A. Bayendor, under whose supervision the contract had been carried out, for the harmonious way they had worked together. The contract for the training of R.A.F. Reserve officers at Hatfield had been renewed, and this would ensure much further work there for a period of four years, work, moreover, which would have to be done on "Tiger Moths" instead of the 9J's used hitherto. In conclusion, Mr. Butler asked for a continuance of the team spirit, and suggested that "Together" would be a good slogan.

MR. C. C. WALKER, Chief Engineer of the Company, proposed the toast of "The Works and Staff." Looking back at the past of aviation, Mr. Walker remembered when a professor had proved that flying could never be economical; yet, he said, to-day the firm had aircraft doing 23 miles to the gallon of petrol. He particularly wished to mention Maj. Halford and his staff, as the work done by them on the firm's engines was responsible to such a very great degree for the success of the D.H. products.

In reply, Mr. F. RADFORD, of the Progress and Planning Department, thought that the programme was a wonderful advertisement for the excellence of their products.

MR. W. E. NIXON, Secretary of the Company, proposed the toast of "Our Guests." He said that they hardly seemed like guests, for they were so well known to all that they had almost become members of the firm. Nevertheless, the part they had played in helping the firm to the place where it now stood was very large indeed, and for that, if for no other reason, the firm owed them a great deal. In particular, he wished to couple the toast with the name of Mr. Ivor McClure, who was responsible for the success of the aviation department of the A.A.

MR. I. MCCLURE, in reply, felt that the D.H. products had established a name for themselves throughout the world which was second to none. He asked those present to glance at the programme and consider whether it was not the most impressive list they had ever seen.

Following the speeches came a concert, to which the talent of the works contributed in no uncertain manner. The Engine Works would appear to be the most prolific in this line, and we wonder whether there is any hidden attraction between the name "Gipsy" and those who are musical. After all, some of the finest musicians in the world—like Rode's orchestra, for examples—are *Tziganes*.

THE ROYAL AIR FORCE

London Gazette, November 29, 1932.

General Duties Branch

The follg. Pilot Officers are promoted to rank of Flying Officer:—J. A. Dixon, P. H. Hamley, E. A. Springall, J. F. Stephens (November 10); C. H. Mallinson (November 13); A. V. Bax, A.F.M. (November 29).

The short service commn. of Acting Pilot Officer on probation W. H. Gerrard is terminated on cessation of duty (November 30); the short service commn. of Pilot Officer on probation P. R. Simpson is terminated on cessation of duty (Nov. 30); Group Capt. H. R. Busted, O.B.E., A.F.C., is placed on retired list (November 14); F/O. J. S. Pole relinquishes his short service commn. on account of ill-health (November 30).

Stores Branch

Flt.-Lt. L. Smith resigns his permanent commn. (September 1). (Substituted for *Gazette*, August 30.)

Medical Branch

Flt.-Lt. R. N. Kinnison, M.B., Ch.B., is granted a permanent commn. in this rank (November 30); F/O. T. A. Hunt, M.B., Ch.B., is transferred to Reserve, Class D (ii) (November 23).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

P. H. Meadway is granted a commn. in Class AA (i) as a Pilot Officer on probation (November 16); F/O. M. H. G. White is granted a commn. in Class C in his present rank, on resigning his commn. in the Auxiliary Air Force (October 24); P/O. on probation M. W. Kimpton is confirmed in rank (October 9); Sqdn. Ldr. H. L. Nunn, D.S.C., D.F.C., is transferred from Class A to Class C (November 28); F/O. C. R. Robbins, M.C., D.F.C. (Capt., Royal Artillery, R.A.R.O.), relinquishes his commn. on completion of service (September 20).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON.—The follg. are granted commns. as Pilot Officers:—R. A. Farquhar (November 4); A. P. Gray (November 5).

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—F/O. M. H. G. White resigns his commn. (October 26).

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON.—P/O. R. Rendle is promoted to the rank of F/O. (November 15).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore C. D. Breeze, A.F.C., to H.Q., Fighting Area, Uxbridge, 20.11.32, on appointment as Senior Air Staff Officer, vice G./Capt. J. H. A. Landon, D.S.O., O.B.E.

Group Captain J. H. A. Landon, D.S.O., O.B.E., to H.Q., Inland Area, Stanmore, 20.11.32, for Engineer Staff duties, vice G./Capt. M. Spicer.

Squadron Leader T. C. Luke, M.C., to No. 18 (B.) Sqdn., Upper Heyford, 19.11.32, to command, vice Sqdn.-Ldr. J. F. Gordon, D.F.C.

Flight Lieutenants: E. H. Rundle, to No. 4 (A.C.) Sqdn., S. Farnborough, 14.11.32. T. H. Carr, to No. 22 (B.) Sqdn., Martlesham Heath, 12.11.32.

R. F. Part, to No. 10 (B.) Sqdn., Boscombe Down, 16.11.32. M. V. Ward, to No. 22 (B.) Sqdn., Martlesham Heath, 23.11.32. V. E. Groom, D.F.C., to No. 28 (A.C.) Sqdn., Ambala, India, 26.10.32. R. B. Sutherland, D.F.C., to Experimental Section, Royal Aircraft Estab., S. Farnborough, 24.11.32.

A. R. Wardle, A.F.C., to H.Q., R.A.F. India, New Delhi, 26.10.32. G. H. Mills, to Aircraft Park, India, Lahore, 26.10.32.

Flying Officers: G. L. C. Jenkins, to R.A.F. Base, Gosport, 16.11.32. A. C. Larmuth, to No. 2 (A.C.) Sqdn., Manston, 15.11.32. M. P. O'Reilly, to Air Armament Sch., Eastchurch, 21.11.32. G. E. B. Stoney, to No. 26 (A.C.) Sqdn., Catterick, 17.11.32. W. H. Kyle, to R.A.F. Base, Gosport, 21.11.32.

Pilot Officers: T. C. Chambers, to No. 84 (B.) Sqdn., Shaibah, 2.11.32. J. H. A. Chapman, to No. 55 (B.) Sqdn., Hinaidi, 2.11.32.

Stores Branch

Flight Lieutenant C. S. Whellock, to No. 2 (Indian Wing) Station, Risalpur, 18.11.32.

Flying Officer J. W. Stokes, to Aircraft Depot, Hinaidi, 9.10.32

Medical Branch

Flight Lieutenant P. D. Barling, to Central Med. Estab., 23.11.32.

Flying Officer J. F. Ziegler, to Palestine General Hospital, 18.11.32.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

Lt.-Coms. (Flt.-Lts., R.A.F.).—A. A. Murray, to *Victory*, for R.A.F. Base, Gosport, for 407 Flight, in command (November 29); and A. M. Rundle to *Victory*, for R.A.F. Station, Manston, and for 460 Flight (November 10).

Lt.-Com. (F/O., R.A.F.) C. A. R. Gibb, to *Furious*, for 466 Flight (November 28).

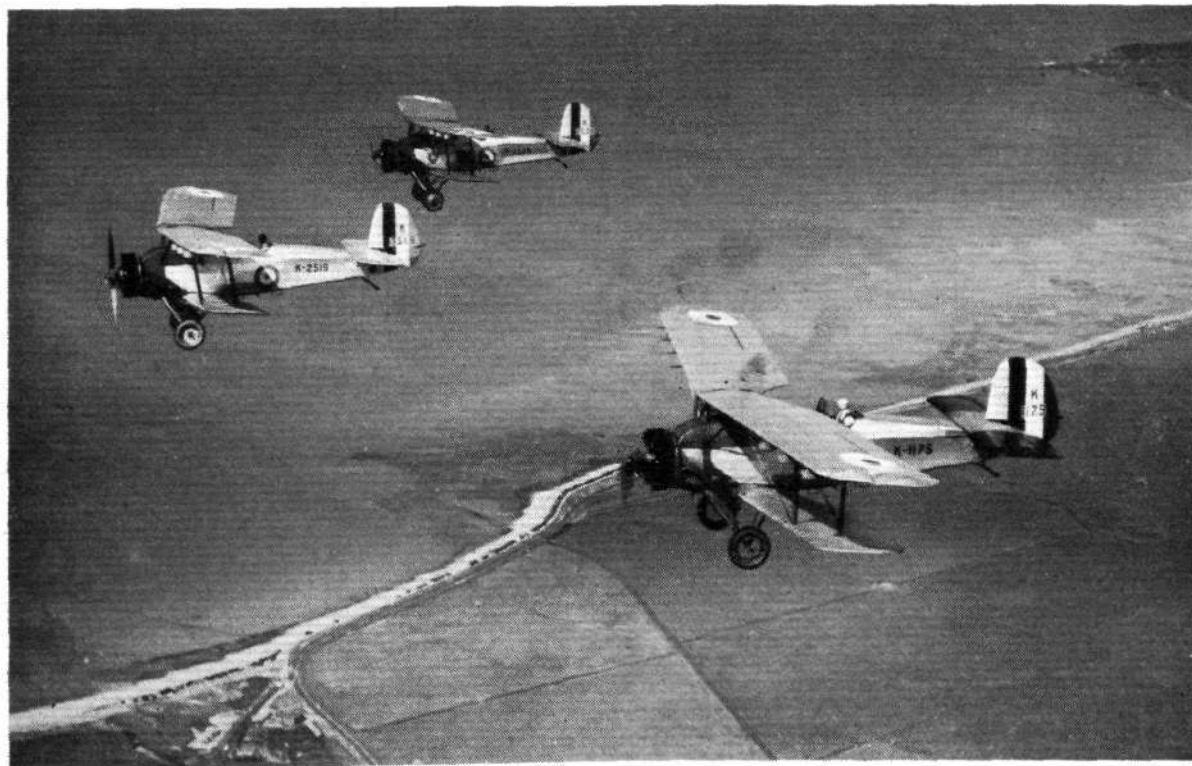
Lieuts. (F/O., R.A.F.).—C. John, to *Victory*, for R.A.F. Base, Gosport, for 407 Flight (November 29); N. S. Luard, F. E. C. Judd, and D. R. F. Cambell, to *Victory*, for R.A.F. Station, Netheravon, and for 405 Flight (November 10); and R. E. Gunston and I. C. Rowe, to *Victory*, for R.A.F. Station, Manston, and for 460 Flight (November 10).

ROYAL AIR FORCE

Squadron Leader C. W. Hill, to *Glorious* (November 16).

Flight-Lieutenants.—F. E. Vernon, to *Glorious*, for 462 Flight (November 12). F. P. Smythies, to R.A.F. Depot (November 14).

Flying Officers.—B. J. Hurren, to R.A.F. Base, Gosport (November 10); R. C. H. Crosthwaite, to *Glorious*, for 448 Flight (November 11); D. G. Morris, to *Glorious* for 460 Flight (November 15); C. G. Davies, to R.A.F. Depot (November 14).



THE SHORES OF SHEPPEY: Three Armstrong-Whitworth "Atlases" of Oxford University Air Squadron out on the prowl. (FLIGHT Photo.)

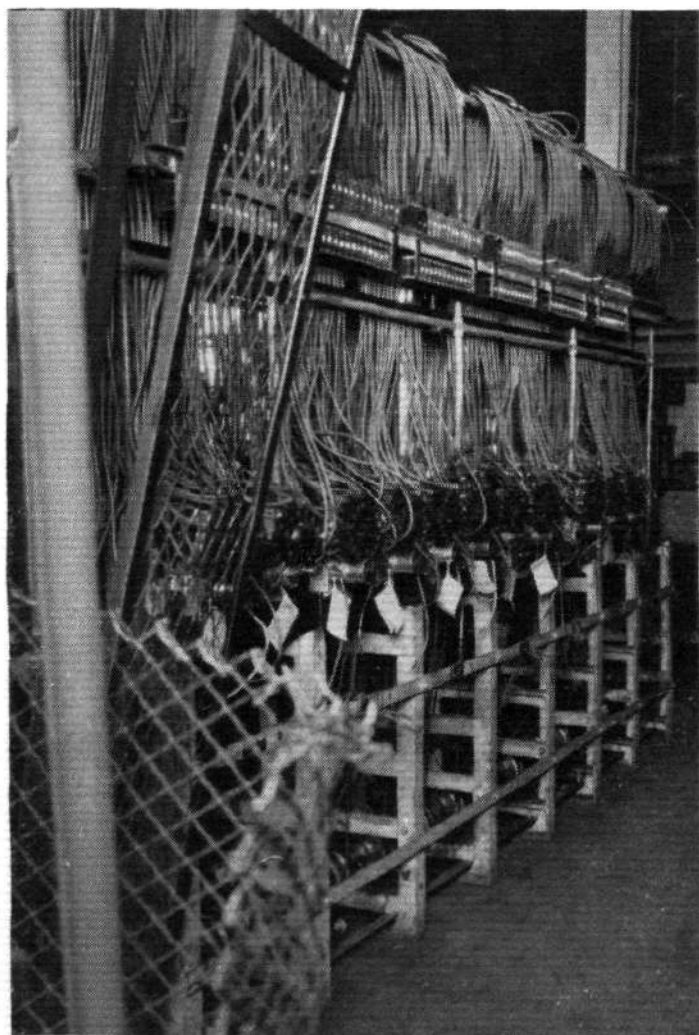
The Industry

The Amazing Rolls

As a result of the excellent service given by Rolls-Royce "Kestrel" engines, it has been decided to increase the rating of the "Kestrel" II S. Under the new rating the rated power at zero boost is 525 b.h.p. at 2,500 r.p.m. normal speed and at 11,500 ft. altitude. The maximum is 595 b.h.p. at 3,000 r.p.m. and at the same altitude. The maximum boost pressure in taking off is 2 lb./sq. in., and the sea level power at rated boost is 485 b.h.p. at 2,500 r.p.m. The engine has been passed by the British Air Ministry at this rating. We shall be surprised if even 600 b.h.p. is the maximum at which the Rolls-Royce engineers are aiming.

Monospars in Italy and France

THE Italian Government is the latest authority to interest itself in the Monospar type of wing construction, and we are informed that they have placed an order with General Aircraft, Ltd., of Croydon, for a wing built on this principle. It is understood that this will be for a Caproni aircraft, possibly the type 97 which was shown at the Paris Show. This machine had an Alpha-Romeo "Jupiter" engine and was intended for light transport. Incidentally it was somewhat damaged in a fire during the Show. During the Show General Aircraft not only had a machine in the Salon, but also a demonstrator out at Le Bourget aerodrome. This created so much interest that it is staying there another week. Already the company is receiving numerous inquiries as a result of having their machines over there.



ON TEST: B.T.H. magnetos are used all over the world in aircraft, and to make them fit for this work they have to be subjected to the most stringent of tests. Above may be seen one of their test benches on which the endurance test is carried out. The magnetos are run here for 8 hr. at 4,000 r.p.m. with the spark gaps regulated to make the output voltage 10,000.

The Pobjoy "R"

A FOLDER issued by Pobjoy Airmotors, Ltd., contains illustrated descriptive matter about the improved 1933 "R" 80 h.p. Pobjoy (described in FLIGHT October 13, 1932). During its comparatively young life this radial engine has achieved an excellent reputation, and the manufacturers are convinced of its ultimate adoption in many phases of aviation. We are reminded in the folder just issued of the Pobjoy's performances, of the flights over the Andes at 18,000 ft. by Mr. Taylor in March, 1932, and the record flight to Australia by Mr. C. A. Butler in November, 1931, the machines in both cases being Comper "Swifts."

Well-Finished Aircraft

MANY remarks have been passed to us concerning the excellent finish of the Fairey machines at the Paris Show. It is worth knowing that these as well as all the other British aircraft shown there were doped with Cellon Dope. The Belgian machines being finished with dope from the Belgian factory of the Cellon Co.

Another Two-Stroke Aircraft Engine

THE development of two-stroke engines for use in aircraft has always been the aim of a large number of designers, owing to the simplicity attendant on the two-stroke principle. The latest is an engine which is being developed by Messrs. C. G. Woodhouse-Temple and G. D. Devaney. This is a four-cylinder-in-line air-cooled engine having airscrew reduction gearing and claimed to give 120 b.h.p. at 4,500 r.p.m. for a weight of 100 lb. The bore and stroke are understood to be about 56 mm. and 110 mm. respectively, while the fuel consumption is spoken of as being only 0.38 lb. per b.h.p./hr.! This engine has already done considerable running on the test bench, but has not to our knowledge yet been type tested; it is naturally supercharged to a high degree, this being, so it is said, in the region of 15 lb./sq. in.

PUBLICATIONS RECEIVED

Aeronautical Research Committee Reports and Memoranda: No. 1426. *Recovery from a Spin.* By L. W. Bryant and Miss I. M. W. Jones. March 1932. Price 1s. 3d. net. No. 1474. *The Distribution of Turbulence over the Central Region of a Pipe.* By A. Fage and H. C. H. Townend. June, 1932. Price 6d. net. No. 1481. *Estimation of Wing Surface Area for Evaporative Cooling.* By C. A. Brown and A. W. Morley. March, 1932. Price 1s. 6d. net. No. 1484. *Reduction of Fire Risk by Induction Pipe Flame Traps.* By A. Swan, Sqdn. Ldr. W. Helmore and W. C. Clothier. Aug., 1932. Price 1s. net. London: H.M. Stationery Office, W.C.2.

L'Année Aéronautique. 1931-1932. By L. Hirschauer and Ch. Dollfus. Dunod, 92, Rue Bonaparte, Paris.

The Beauty of Flight. By Dr. Manfred Curry. With a Preface by C. R. Fairey, M.B.E. London: John Miles, Ltd. Price 15s. net.

War in the Air, 1936. By Maj. Holders. Translated from the German by C. W. Sykes. London: John Hamilton, Ltd. Price 7s. 6d. net.

Aeronautical Research Committee Reports and Memoranda. No. 1488. *Slipstream Effect on the Downwash and Velocity at the Tailplane.* By F. S. Bradfield. June, 1932. London: H.M. Stationery Office, W.C.2. Price 9d. net.

NEW COMPANY REGISTERED

BRITISH HERCANO ENGINES, LTD.—Capital £25,000 in £5 shares. *Manufacturers of and dealers in internal-combustion engines, etc.* The Hercules Motors Corporation of Canton, Ohio, U.S.A., and Broom & Wade, Ltd., of High Wycombe, Bucks, or their nominees, have the respective right to acquire 2,550 and 2,450 shares for cash at par within 30 days of the incorporation of the company. First directors:—H. S. Broom (first chairman and managing director), C. Balough and A. E. Beauchamp. Solicitors:—Lloyd & Armstrong, 3-4, Lincoln's Inn Fields, W.C.2.

Increases of Capital

AIRCRAFT & GENERAL FINANCE CORPORATION, LTD. (Bush House, Aldwych, W.C.2).—The nominal capital has been increased by the addition of £1,900. n £1 ordinary shares beyond the registered capital of £100.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1931

Published December 8, 1932.

- 22,436. W. DENNY & BROS., LTD., and J. F. ALLAN. Screw propellers. (383,316.)
- 22,722. V. E. S. MITCHELL. Wind indicators. (383,322.)
- 28,537. A. J. ROWLEDGE, A. A. RUBBRA, and G. H. FARMER. Controlling means for aircraft engines. (383,378.)
- 31,107. C. E. JOHNSON. Flying machines. (383,408.)
- 33,502. M. LEYAT. Aircraft, for use over land or water. (383,441.)

APPLIED FOR IN 1932

Published December 8, 1932.

- 5,542. L. MARMONIER. Flight device evolved from the ordinary aeroplane and the helicopter. (383,494.)
- 5,652. L. MARMONIER. Flight device evolved from the ordinary aeroplane and the helicopter. (383,497.)
- 19,382. Sir W. G. ARMSTRONG-WHITWORTH AIRCRAFT, LTD., and J. LLOYD. Control surfaces of aircraft. (383,590.)